The EDISON ELECTRIC INSTITUTE BULLETIN

GEOGRAPHY & INDUSTRY

June 1954

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Published Monthly by Edison Electric Institute

EEI Convention Issue

Walter H. Sammis

C. Hamilton Moses

Mark Anton

George M. Gadsby

Charles E. Wilson

F. W. Page

Sherman R. Knapp

Grant A. Martell

E. H. Snyder

Robert Driscoll

Stuart Campbell

Alvin Schlosser

Walker L. Cisler

Jerome K. Kuykendall

Harold Quinton

ELECTRICAL RESEARCH STATISTICS
THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

March, 1953-1954

SOURCE AND DISPOSAL OF ENERGY—MONTH OF MARCH

	1954	1953	%
NET GENERATION* (Kwhr in thousands)			
By Fuel Burning Plants	28,997,663	26,771,450	+ 8.3
By Water Power Plants	9,920,793	10,197,381	− 2.7
Total Generation	**38,918,456**	**36,968,831**	**+ 5.3**
Add—Net Imports Over International Boundaries	67,217	151,551	−55.7
Less—Company Use	124,192	127,877	− 2.9
Less—Energy Used by Producer	846,322	504,630	+67.7
Net Energy for Distribution	**38,015,159**	**36,487,875**	**+ 4.2**
Lost and Unaccounted for	4,983,248	4,683,058	+ 6.4
Sales to Ultimate Customers	**33,031,911**	**31,804,817**	**+ 3.9**

CLASSIFICATION OF SALES

NUMBER OF CUSTOMERS—As of March 31			
Residential or Domestic	42,149,303	40,975,050	+ 2.9
Rural (Distinct Rural Rates)	1,621,465	1,570,255	+ 3.3
Commercial or Industrial:			
Small Light and Power	5,875,950	5,675,164	+ 3.5
Large Light and Power	271,228	264,322	+ 2.6
Other Customers	160,272	157,130	+ 2.0
Total Ultimate Customers	**50,078,218**	**48,641,921**	**+ 3.0**
KILOWATTHOUR SALES—During Month of March (Kwhr in thousands)			
Residential or Domestic	9,238,543	8,365,080	+10.4
Rural (Distinct Rural Rates)	663,371	670,676	− 1.1
Commercial or Industrial:			
Small Light and Power	5,793,921	5,426,450	+ 6.8
Large Light and Power	15,734,415	15,776,526	− 0.3
Street and Highway Lighting	341,587	319,946	+ 6.8
Other Public Authorities	768,328	735,671	+ 4.4
Railways and Railroads:			
Street and Interurban Railways	246,752	259,250	− 4.8
Electrified Steam Railroads	191,942	202,227	− 5.1
Interdepartmental	53,052	48,991	+ 8.3
Total to Ultimate Customers	**33,031,911**	**31,804,817**	**+ 3.9**
Revenue from Ultimate Customers (Thousands)	**$589,223**	**$558,999**	**+ 5.4**

RESIDENTIAL OR DOMESTIC SERVICE

AVERAGE CUSTOMER DATA—For 12 Months Ended March 31			
Kilowatthours per Customer	2,398	2,211	+ 8.5
Average Annual Bill	$65.23	$61.02	+ 6.9
Revenue per Kilowatthour	2.72¢	2.76¢	− 1.5

* By Courtesy of the Federal Power Commission.

THE EDISON ELECTRIC INSTITUTE BULLETIN is published monthly by the Edison Electric Institute, an association of electric light and power companies in the United States and its territorial possessions. Its affiliate members consist of members of the Canadian Electrical Association.

The objectives of the Edison Electric Institute are:

The advancement in the public service of the art of producing, transmitting, and distributing electricity and the promotion of scientific research in such field.

The ascertainment and making available to the members and the public of factual information, data, and statistics relating to the electric industry.

To aid its operating company members to generate and sell electric energy at the lowest possible price commensurate with safe and adequate service, giving due regard to the interests of consumer, investor, and employee.

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Closing date for the BULLETIN is the tenth of the month preceding the month of issue.

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The EDISON ELECTRIC INSTITUTE BULLETIN

June, 1954

Vol. 22 No. 6

Articles, Speeches, Reports

Jubilee Convention Commemorates Progress, Dedicates Itself to Further Public Service 170
Remarks of Harold Quinton in Accepting Presidency of Edison Electric Institute 174
American Gas and Electric Company Wins Charles A. Coffin Award 178
The President's Address
Walter H. Sammis 179
To the Memory of Thomas A. Edison
The Hon. Mark Anton 183
The Meaning of Light's Diamond Jubilee
Charles E. Wilson 187
Selling for the Future Load
Sherman R. Knapp 189
Power System Engineering Faces a New Challenge
E. H. Snyder 193
Facing Up to the Cost Problem
Stuart Campbell 197
Looking Ahead to the Last Quarter of the First Century of Electric Power in the United States
Walker L. Cisler 199
People Organized and in Action
C. Hamilton Moses 205
Preference Clause—Santa Clause to the Favored Few, But Paid for by the Nation *George M. Gadsby* 209
An Appraisal of the Market for Long-Term Capital
Grant A. Martell, Robert Driscoll, Alvin Schlosser, and F. W. Page 213
Rates and Securities Regulation by the Federal Power Commission
Jerome K. Kuykendall 221
Industrial Relations Conference Program
Fred R. Rauch 224
Electrical Equipment Committee Meeting
A. M. deBellis 226
Hydraulic Power Committee Meeting
P. M. Hess 228
Meter and Service Committee Meeting
C. V. Morey 229
Transmission and Distribution Committee Meeting
J. W. Anderson 230
Purchasing and Stores Committee Meeting
Carl H. zur Nieden 232

News, Notes, Miscellany

New Food-Freezer Booklet Available 186
Street Tree Utility Conference to be Held in Cleveland Next March 196
Companies Urged to Order Jubilee Materials Early 220
EEI Industrial Relations Committee to Meet 225
EEI Publications and Service Material 233
Personals 235
Conventions and Meetings 236

HAROLD QUINTON

Newly Elected President of the Edison Electric Institute

The EDISON ELECTRIC INSTITUTE
BULLETIN

Jubilee Convention Commemorates Progress, Dedicates Itself to Further Public Service

THE 22nd Annual EEI Convention welcomed some 3300 delegates and guests from every section of the country who gathered in Atlantic City, June 1-3, to participate in the observance of Light's Diamond Jubilee and to plan future industry development. The meeting was the largest in Institute history.

The convention took the form of a commemoration and a dedication. It commemorated the 75 years of electrical progress since Thomas A. Edison invented the first practical incandescent lamp, and it dedicated the industry's technical resources to increasingly high standards of public service.

In the opening convention address, Institute President Walter H. Sammis established the tenor of the meeting when he pointed out, "We have set standards of achievement that afford us no prospect of relaxation in the years to come in our efforts to serve capably."

Anniversary Greetings Read

Providing an inspirational basis for the convention, the first general session paid tribute to Edison and his works. Mr. Sammis read anniversary greetings to the industry from President Eisenhower and Henry Ford II, whose grandfather was a long-time friend of Edison. John Edison Sloane, Secretary of Edison Pioneers, Public Relations Director of Thomas A. Edison, Inc., and grandson of the great inventor, also read a message from his uncle, Charles Edison, Chairman of Thomas A. Edison, Inc., former Secretary of the Navy and former Governor of New Jersey. Excerpts from these messages appear on page 177.

Through the medium of the motion picture, Edison was seen addressing the industry his work fostered. The film, Mr. Sammis pointed out, was made toward the end of Edison's fruitful career.

"The first section," Mr. Sammis continued, "was made on the occasion of Light's Golden Jubilee in 1929, at the inventor's summer home in Ft. Meyers, Fla. The second was made in 1930 at Edison's New Jersey laboratory. It enabled him to address the industry's convention in San Francisco and the World Power Conference in Berlin simultaneously."

The Hon. Mark Anton, member of the New Jersey State Senate from Essex County, described Edison the man and his personal creed, and Charles E. Wilson, Chairman of Light's Diamond Jubilee Sponsoring Committee, spoke on the meaning and message of the Jubilee.

Jubilee Medal Presented

Before delivering his address, Mr. Wilson presented the official medal of Light's Diamond Jubilee to John Edison Sloane.

"We hope that you, as a representative of the Edison family," Mr. Wilson said, "will take back with you this small but tangible token of our industry's deep appreciation and regard. . . . Its principal symbol is the original lamp, and it indicates the tremendous advances for all people that grew out of the first fragile bulb.

"It carries the Jubilee motto: 'Light for Freedom — Power for Progress,' the words commemorating Thomas A. Edison's invention of the first practical incandescent lamp on October 21, 1879," Mr. Wilson continued. "To give proper recognition of this achievement, the advances of our entire civilization would have to be offered. So please accept this

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Los Angeles, California

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Atlanta, Georgia

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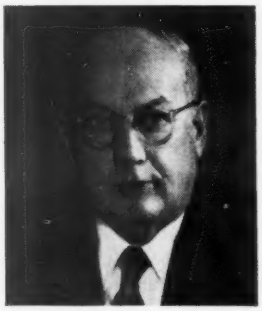

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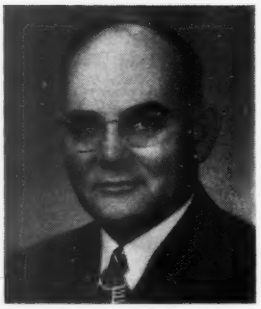

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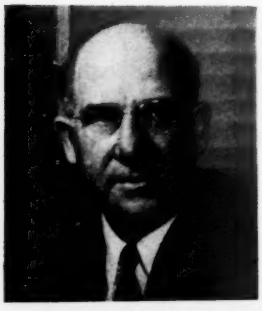

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ing & Power Co.

HAROLD QUINTON
President, Southern
California Edison Co.

L. V. SUTTON
President, Carolina
Power & Light Co.

medal as symbolic of all that it encompasses and take with it our affection and respect."

"This medal, I know, does not honor me," Mr. Sloane replied, "but I accept it in behalf of my family as a token from your great industry in recognition of the work my grandfather did in helping to create electric light and power service."

The remaining four general sessions were devoted to methods of bettering electric service and advancing the industry in the public interest. At these sessions, 16 nationally known businessmen, scientists, and government officials discussed many of the most important problems and opportunities confronting the industry. With the exception of four that will be published in next month's BULLETIN, all of the convention addresses appear in this issue.

Election of Officers

Harold Quinton, President and Director of Southern California Edison Co., was elected President of the Institute at the convention, succeeding Mr. Sammis. He was installed as new EEI chief executive on Thursday morning. After leading delegates and guests in a vote of thanks to Mr. Sammis for his unstinting service to the Institute and the industry during the past year, Mr. Quinton summarized the Institute's objectives in the month's ahead. His remarks appear on page 174.

Harllee Branch, Jr., President of Georgia Power Co., was elected EEI Vice President. Harold S. Sutton, Treasurer of Consolidated Edison Co. of New York, Inc., was re-elected Treasurer of the Institute, and 15 member company executives were named to the EEI Board of Directors.

Col. H. S. Bennion, Institute Vice President and Managing Director, and A. B. Morgan, Institute Assistant Managing Director and Secretary, were also re-elected to their posts.

By day Atlantic City was sunlit and warm, with delightful breezes blowing in from the sea. At night the boardwalk area was bright with Jubilee lighting. Searchlights probed the sky, and lighting on many of the boardwalk establishments had a Jubilee theme.

All of the convention's five general sessions were held in the Ballroom of Convention Hall, which the electric industry helped dedicate 25 years ago during Light's Golden Jubilee.

Prize Awards

At the Wednesday morning general session, the EEI Prize Awards Committee conducted presentation of the Reddy Kilowatt Annual Report Award and the Claude L. Matthews Valor Award. In the absence of Committee Chairman Harry Restofski, George W. Ousler, Vice President of Duquesne Light Co. and a member of the committee, presided.

Mr. Ousler reported that there was an increase in the number of entries in the seven commercial contests for which prizes were awarded earlier this year at the EEI Sales Conference. This, Mr. Ousler said, indicated "lively and well-planned sales promotion in all markets."

However, he urged small- and medium-size companies to enter more of the contests for 1954. "Most of the contests have special provisions for such companies, and the judges take into account the job done in relation to the territory." He pointed out that "the mere process of assembling entries is always enlightening and valuable to all concerned."

The Reddy Kilowatt Annual Report Award is sponsored every year by the Reddy Kilowatt Service and presented to the company whose annual report best simplifies, dramatizes, and humanizes company operations. The award, consisting of a bronze plaque, was won by Arkan-

NEW PRESIDENT OF THE INSTITUTE

HAROLD QUINTON, President and Director of Southern California Edison Co., was elected President of the Edison Electric Institute by the EEI Board of Directors on June 3, at the Institute's 22nd Annual Convention. He succeeds Walter H. Sammis, President of Ohio Edison Co.

First Pacific coast electric company executive to hold the EEI presidency, Mr. Quinton has been Vice President of the Institute for the past year. He was inducted as President on the closing day of the convention.

His appointment as EEI chief follows by a month and a half his election as President of Southern California Edison Co. He became the company's top executive officer in April, after having served as executive vice president since 1948. His association with the company began in 1942, when he was elected vice president in charge of finance. Formerly, he was a partner for 16 years in Arthur Andersen & Co., certified public accountants. Prior to this he was with the Treasury Department in Washington, D. C. He became a member of Southern California Edison's Board of Directors in 1945 and has been a member of its Executive Committee since 1949.

Mr. Quinton's record of community service is not confined to the electric industry alone but includes participation in many important industrial and civic activities. He is a director of the California Bank and Pacific Mutual Life Insurance Co., both in Los Angeles, and is a director of the Los Angeles Chamber of Commerce. He is also a leading figure in affairs of the Pacific Coast Electrical Association, of which he is a past vice president and director.

Topeka, Kan., was Mr. Quinton's birthplace and boyhood home. He attended grade school, Topeka High School, and Washburn Academy there before attending Northwestern University. He served in the cavalry and field artillery in World War I.

As president of Southern California Edison Co., Mr. Quinton is top executive officer of the sixth largest electric company in the United States, and one whose growth has been most spectacular. In the years 1949-1953, inclusive, his company headed the list of electric companies in the nation in the number of new customers added to the lines. In that period nearly 320,000 new customers were served by the company. Southern California Edison serves approximately 3,500,000 people in an area of about 14,250 square miles in Central and Southern California. The company has more than 7500 employees and nearly 85,000 stockholders.

Remarks of Harold Quinton in Accepting Presidency of Edison Electric Institute

NO ONE could fail to feel sobered and humbled by the prospect of heading the organization that represents the great electric light and power industry in America. That prospect in normal times, with the myriad problems in which we engage, would be stimulating enough, but in these times of fundamental changes in the national economy, it is challenging indeed. I am, also, greatly honored that my appointment should come in the year of the Light's Diamond Jubilee.

As usual, your new president has been asked what his policies will be, and it is important to emphasize again that it is not the purpose of the Edison Electric Institute to set policy for the industry. Policy is, and must continue to be, the prerogative and responsibility of the managements of the individual company members. My policies, therefore, must be confined to carrying out the constitutional objectives of this organization.

Briefly, and condensed, they are three in number:

First: The advancement of the art of production, transmission and distribution of electricity, and the promotion of scientific research in such field.

This objective dates from the first convention of our predecessor association, which was held in Chicago in February, 1885. All of the 16 subjects programmed at that convention dealt with improvements in the electric arts. And today, the activities of the Institute and its members in the field of atomic energy are simply another example of that continuous endeavor. The purpose of all of these activities has been the improvement of facilities in the interests of a wider public service at a lower cost. And that has been the objective and the accomplishment of the investor-owned companies for 68 years. It will be my purpose and policy to continue to support the numerous committees of the Institute that are active in that work.

Second: The second objective of this organization is to aid operating companies to generate and sell electric energy at the lowest possible price commensurate with safe and adequate service.

Now that some of the abnormalities of the past few years are tending to disappear, or to become more normal, and as the need for further useful utilization of plant capacities increases, greater emphasis must be directed to both costs and sales. Increased activities in the direction of these needs have progressed well during the past year and will also continue to have an important place in our attention during the ensuing year.

Third: The third objective of the Institute is to compile and furnish statistical and other information to members of the Institute and to the public.

Under this third category I conceive it to be my duty to carry to the public certain matters which are the unanimous policies of the member companies.

Briefly, therefore, in addition to the activities essential to the first two objectives named, I would propose the following general program for the ensuing year:

1. We will continue to point out, and to cooperate in, the elimination of the cost of unnecessary duplication in regulatory processes. In this connection, the costly requirements for registration of our securities offerings should not be overlooked. Investor-owned utilities have filed registration statements at least once, and a great many of them, an average of twice annually for a long period of years. The greater part of these repetitive filings are simply additive to the cost of money and serve little or no useful purpose in the protection of investors, or otherwise. Substantial modification of registration requirements, in the light of regulatory and other reports that are publicly available, is amply justified and would effect millions of dollars in savings to consumers.

2. The members of the Institute stand for, and for many years have made important contributions to, sound economic conservation, development, and utilization of the water resources of the nation in the public interest. They recognize that the Federal government has a proper place and interest in the development of water resources in connection with projects for navigation, flood control, and reclamation of public lands. And they will cooperate, as in the past, in legitimate and feasible developments of such character. However, in each such instance, private enterprise rather than government should undertake the generation, transmission and distribution of any related electric power development.

3. As individual companies and as an Institute, we will continue to make available to the American people full information on costs, return on investment, rates, capacity to supply the power demand, expansion plans, advances in equipment and methods, sales programs, new uses for electricity, and every other development we think will interest our customers and the public generally.

This course dwarfs the influence of misinformation on threatened power shortages, high rates, big profits, grabs, or steals of natural resources, etc., habitually spread by advocates of more government power.

At the same time, we will continue to unmask and urge removal of the supports of government power—tax exemptions, selling power from Federal dams far below true cost, and the un-American preference clause to the favored few.

The American people have grown wary of the claimed benefits of governments in business. They are learning through taxes and appropriations that the real price of government power is high, and their voice is being heard in Washington. They are learning that there is no magic in socialism that can produce power cheaper than it can be produced by the time-honored American

(*Continued on page* 235)

sas Power & Light Co. C. Hamilton Moses, Chairman of the Board, accepted the plaque on behalf of his company.

Honorable Mention Certificates were also awarded to Pennsylvania Power & Light Co., New York State Electric & Gas Corp., The Kansas Power and Light Co., and Pennsylvania Power Co. Ashton B. Collins, President of Reddy Kilowatt, Inc., made the presentations.

The Claude L. Matthews Valor Award honors acts of devotion to duty where extraordinary courage is exercised to maintain important electric service or to restore service in the shortest possible time. The Valor Awards for 1953 were won by employees of Pennsylvania Power & Light Co. and Portland General Electric Co. The donor of the awards, Claude L. Matthews, Vice President of W. N. Matthews Co., a division of the A. B. Chance Co., made the presentations.

Pump Room Attendant James E. Steeley, Jr., and Instrument Man Robert L. Wagner, Pennsylvania Power & Light Co., were cited for exhibiting "courage and fortitude far beyond the normal call of duty" when fire broke out in a hydrogen control cubicle at one of the company's plants on August 31, 1953. Flames rising seven to ten feet above the eight-foot cubicle enveloped the valves on hydrogen lines to a nearby generator, making it impossible to shut the valves off.

Faced with the possibility of an explosion that they could not have expected to survive, both men attacked the fire with extinguishers. They worked close to the cubicle and in the midst of intense heat. Finally they isolated the valves in order to shut them off and shortly thereafter extinguished the fire completely. The two men in all probability prevented the loss of as much as 240,000 kw of capacity for an extended period.

Station Operator H. H. Hoygaard, Portland General Electric Co., received his Valor Award for risking his life on June 15, 1953, when an internal failure caused the explosion of a hydroelectric plant turbine. The explosion hurled parts of a heavy iron housing through the side of the plant. Water from the ruptured turbine blasted bricks from the wall and within minutes had flooded the entire plant to a depth of six feet.

By quick action and disregard for personal safety, Hoygaard isolated the plant electrically from the rest of the system. This averted a vast amount of possible electrical damage. Fighting to remain at his post, he was finally swept bodily outdoors by the rush of water. But he demonstrated continuing devotion to duty by rapid manual operations of headgates and stop logs, thereby averting other possible flood damage.

In receiving their Valor Awards, Messrs. Steeley, Wagner, and Hoygaard were commended for "courage and initiative" at a great personal risk, in keeping with "the high traditions of the electric service industry."

HARLLEE BRANCH, JR.
Newly Elected Vice President of the Edison Electric Institute

HARLLEE BRANCH, JR., President of Georgia Power Co., was elected Vice President of the Edison Electric Institute at its 22nd Annual Convention in Atlantic City. He will hold office for the next year, succeeding Harold Quinton, who has been named President of the Institute.

A native of Atlanta, Mr. Branch was graduated from Davidson College in 1927 with a B.A. degree. That same year he entered Emory University as a law student, completing his studies in 1931.

From 1929 to 1931, while attending Emory, he was a reporter for the *Atlanta Journal*, and from 1930 to 1932 he was publicity director for radio station WSB.

In 1931 Mr. Branch became associated with the law firm of MacDougal, Troutman, Sams and Branch, general counsel for Georgia Power Co. As a member of the law firm, he handled legal matters for the electric company until 1949, when he was elected vice president, general manager, and a director of Georgia Power. Two years later he was named president of the company.

During World War II, he served as a lieutenant in the United States Navy.

He is a director of The Southern Co. and Southern Services, Inc.; a director of the Federal Reserve Bank of Atlanta; and president of the Southeastern Electric Exchange.

Mr. Branch is a former instructor of law at Emory University, University of Georgia Evening College, and Atlanta Law School. He is a member of the Board of Trustees of Emory University, Georgia Tech Research Institute, and Columbia Theological Seminary. He is a former president of the Davidson College Alumni Association.

Long interested in civic work, he has been active in the Atlanta Community Chest and is a director of the Atlanta Chapter of the American Red Cross; YMCA Council of Georgia; Junior Achievement of Georgia, Inc.; and Georgia 4-H Club Foundation. He is a member of the Executive Committee of the Atlanta Conference of Christians and Jews and of the Advisory Board of St. Joseph's Infirmary.

Mr. Branch is also a member of the Central Atlanta Improvement Association, Policy Committee of the U. S. Chamber of Commerce, and President's Council of the American Institute of Management. A former president of the Atlanta Bar Association and Atlanta Legal Aid Society, he serves on the Board of Trustees of the Atlanta Art Association and as a director of the Atlanta Symphony Guild.

Mr. Branch just completed a term of office as a member of the EEI Board of Directors.

Special Events

The Institute was host to the ladies at a luncheon held in Trimble Hall of the Claridge Hotel on Wednesday. On hand to welcome them to a program of special entertainment were Mr. Sammis and B. L. England, Chairman of the Program Committee. A fashion show was presented by Schiaparelli, Inc., and Cornelia Otis Skinner appeared in three of her incomparable character sketches.

Later that night American Gas and Electric Co. received the Charles

George Ousler (left), EEI Prize Awards Committee, presides at presentation of Matthews Valor Awards to James E. Steeley, Jr., and Robert L. Wagner, Pennsylvania Power & Light Co. Claude L. Matthews (right), Vice President of W. N. Matthews Co., donor of the awards, made the presentations.

H. H. Hoygaard (left), Portland General Electric Co., displays the certificate accompanying the Valor Award presented him by Mr. Matthews.

C. Hamilton Moses (left), Chairman of the Board, Arkansas Power & Light Co., accepts the Reddy Kilowatt Annual Report Award from Ash Collins, President of Reddy Kilowatt, Inc., award donor.

John Edison Sloane (left), grandson of Thomas Alva Edison, receives the official medal of Light's Diamond Jubilee as a "small but tangible token of our industry's deep appreciation and regard" from Charles E. Wilson, Chairman of the Jubilee Sponsoring Committee. Institute President Walter H. Sammis (center) looks on.

The above exhibit of Light's Diamond Jubilee materials made by display manufacturers was set up in the lobby of Hotel Traymore. Another exhibit at the entrance of Convention Hall called attention to Jubilee activities throughout the nation and also displayed additional materials. (See story, page 220.)

A. Coffin Award in a ceremony conducted at the Warner Theatre on the Boardwalk. The award was presented to Philip Sporn, President of American Gas and Electric Co., by Philip D. Reed, Chairman of General Electric Co. Parts of the presentation, which is described more fully on page 178, were broadcast by CBS Radio.

Following the ceremony, a program featuring noted theatrical and musical personalities was presented through the courtesy of Westinghouse Electric Corp. Victor Borge regaled the audience with his "Comedy in Music." Percy Faith conducted the Robin Hood Dell Orchestra in selections ranging from Broadway show tunes to excerpts from Tschaikowsky's B Minor Concerto, with Mr. Borge at the keyboard. Jean Fenn, of the Metropolitan Opera Association, lent her charming voice and personality to the proceedings, and Betty Furness graciously introduced and closed the program.

Acknowledgments

"A good convention just doesn't happen," Mr. Sammis said in closing the 22nd Annual EEI Convention on Thursday. "This Jubilee meeting owes its success to the efforts of many individuals and organizations . . . so many, in fact, that most will have to remain unnamed. But all should know that they have our deep appreciation."

In mentioning "a few of the people who contributed much to this meeting," Mr. Sammis cited the Convention Program Committee for securing the excellent speakers heard during the business sessions. Special tribute was paid Westinghouse Electric Corp. for the excellent musical program it presented on Wednesday night, and appreciation was expressed to other manufacturers "whose hospitality provided much pleasant diversion after hours."

Atlantic City Electric Co. was thanked for all the behind-the-scenes details its people handled and *Electrical World* was commended for publishing the *Unconventional Daily*, the convention's own newspaper, with its interesting coverage of events and personalities.

Excerpts from Congratulatory Messages to the Institute's Jubilee Convention

FROM DWIGHT D. EISENHOWER, *President of the United States:*

"My warm greetings go to all members of the Edison Electric Institute who are assembled in Atlantic City to celebrate the 75th anniversary of Thomas Alva Edison's invention of the incandescent lamp.

"This invention and the gigantic industry based on it have made immeasurable contributions to this nation's strength. In America's continuing efforts to improve the living standard of its citizens, the light and power industry is an instrument of inestimable value.

"You have my best wishes for a pleasant and productive meeting."

FROM CHARLES EDISON, *Chairman of Thomas A. Edison, Inc.:*

" . . . to the entire membership of EEI, I send my every best wish for many, many more years of progress and prosperity for the power and light industry, the cornerstone of America's industrial greatness."

FROM HENRY FORD II, *President of Ford Motor Co.:*

"Like every other industry in America, Thomas Edison and his achievements have had a profound effect on the automobile industry in many ways.

"We in the Ford Motor Co. and in our family know well the inspiration and encouragement he gave my grandfather in the early years of our company's growth and development. We had many opportunities to know the many sides of the great benefactor of mankind because he was one of my grandfather's closest friends.

"I can think of no greater tribute to Mr. Edison than to repeat the words of my grandfather some 25 years ago . . . 'It has sometimes been said that we live in an industrial age. It might better be said that we live in the age of Edison. Edison did more to abolish poverty than any other person or group of persons since the beginning of the world.'

"While the miracle of his lamp and the great electric light and power industry which he founded remind us daily of his greatness, he has left America with a heritage that will live forever. He stands as a symbol of individual and free initiative, which he always contended made our country the hope of the world.

"I am certain that, were Mr. Edison living today, he would be right in the middle of the intricate problems in which the groups of electric power companies and others find themselves as they study the potentialities of utilizing the heat of atomic fission for industrial and peacetime purposes. We of the Ford Motor Co. are proud to be associated with electric companies and others of America in this great challenge and endeavor.

"Coincident with Light's Diamond Jubilee is the 25th Anniversary of the Henry Ford Museum and Greenfield Village, dedicated by Mr. Edison on the occasion of the Golden Jubilee of Light in 1929. As you probably know, while Mr. Edison was still living, my grandfather had brought to Greenfield Village the laboratories of Menlo Park, and these have been visited by millions of peoples in all walks of life and from many countries. To celebrate Edison's momentous achievement, the Museum and Village, with the cooperation of Detroit Edison, General Electric, and Westinghouse Electric, are presenting a special program through the balance of the year to be fittingly climaxed on October 21st. We hope you and other members of the Edison Electric Institute find time to visit with us at Dearborn and enjoy this program."

American Gas and Electric Company Wins Charles A. Coffin Award

FOR distinguished pioneering of advanced engineering concepts, the American Gas and Electric Co. has received the electric industry's highest honor, the Charles A. Coffin Award.

The award was presented to Philip Sporn, AGE President, by Philip D. Reed, Chairman of the General Electric Co., in ceremonies conducted at the Institute's 22nd Annual Convention. Walter H. Sammis, President of the Institute, presided.

Based on Engineering Advances

The award was based specifically on two important engineering advances made by AGE in 1953: the initial operation of the nation's first 330,000-v transmission line, and the initiation of the manufacture and installation of the nation's first electric power generating unit to utilize ultra-high-pressure steam.

The first section of the AGE system's new 330,000-v transmission network was placed in operation in Ohio and West Virginia by The Ohio Power Co. and Appalachian Electric Power Co. When linked with other sections of 330,000-v line now under construction throughout AGE territory, the network will serve as the backbone of the system's bulk power delivery. These new, super-high-voltage lines — capable of carrying seven times the power of the system's previous principal lines of 132,000-v, and at much less cost—will have the capacity to serve the power requirements of AGE's seven-state service territory for many years to come.

Construction of the new 330,000-v network, which was begun in 1951, was preceded by five years of extensive and intensive research into the problems and economics of super-high-voltage transmission. For this purpose, AGE—in co-operation with several leading manufacturers of electrical equipment—constructed a full-scale "outdoor transmission laboratory" at Brilliant, Ohio, where tests were conducted at levels as high as 500,000 v.

The new, super-critical-pressure generating unit is a developmental machine on which AGE initiated engineering and design work last year. It will be installed in the Philo (Ohio) Plant of Ohio Power and will **have a capacity of 120,000 kw.**

The unit will operate at a steam pressure of 4500 psi—far above the critical pressure of 3206 psi, at which point water flashes instantaneously into steam without an intermediate "boiling" stage. It is a revolutionary new approach to achieving greater efficiencies and economies in steam generation and, within the electric industry, has been likened to the first cracking of the sound barrier by the aviation industry.

Other important and unprecedented features of the Philo unit are its utilization of steam at a temperature of 1150 F and the double reheat of the steam, both of which are still further steps toward increased efficiency and economy.

"Bold Steps Forward"

The citation to AGE termed the 330,000-v line and the Philo generating unit as "bold steps forward" in the art of electric power supply and delivery. These advances will make possible the more economical production and transmission of electric power and will benefit not only AGE but the entire electric industry —through its historic tradition of free and voluntary interchange of information.

In the words of the citation, AGE, by this pioneering, was "notably demonstrating the continuing ability of the electric utilities to expand service benefits to the American people through technological advances."

The AGE system, made up of seven electric companies, serves a population of 4,750,000 and 2300 communities in parts of seven states: Indiana, Michigan, Ohio, West Virginia, Virginia, Kentucky and Tennessee. The companies of the system are The Ohio Power Co.; Appalachian Elec-

(*Continued on page* 204)

Philip Sporn (right), President of American Gas and Electric Co., accepts the Charles A. Coffin Award and Citation on behalf of his company. Philip D. Reed, Chairman of General Electric Co., donor of the award, made the presentation in a ceremony conducted during the 22nd Annual EEI Convention. Institute President Walter H. Sammis (center) presided.

The President's Address

Walter H. Sammis

President, Edison Electric Institute, and
President, Ohio Edison Company

An address before the 22nd Annual EEI Convention, Atlantic City, N. J., June 1, 1954

THIS year the electric industry—utilities, manufacturers, and others—is celebrating Light's Diamond Jubilee, the 75th anniversary of Edison's invention of the first practical incandescent lamp. This invention started a chain reaction in the harnessing of electric energy that has had a profound impact on the social and economic life of the world. Others will pay direct tribute to Thomas Alva Edison. I shall endeavor to point out a few significant mileposts in the industry's progress.

We in the electric industry can look back upon 75 years of glorious achievement in service to mankind. In this comparatively short period, electricity has been brought to about 99 per cent of all occupied establishments in the United States. It is available to 98 per cent of all occupied farms. Truly, it is the servant of the American people. It is low in price, the average for all classes of electric service in 1953 being 1.77 cents per kilowatthour versus 2.16 cents in prewar 1939. For residential service the average price paid last year was 2.74 cents as compared with 4 cents in 1939. (Incidentally, it was 24 cents in 1883, the first year for which data is available.) The household user today only spends about 1 per cent of his disposable personal income (i.e., the money he has left to spend after taxes) for electric service. In industry only 6/10 of 1 per cent of the cost of the finished product on the average was spent for electricity last year.

Era of Inflation

These exceptional records have been established during an era of unusual inflation, when the purchasing power of the dollar has dropped 50 per cent, when construction costs, Federal taxes, labor rates, and the price of fuels have more than doubled. These economic changes have made rate increases a necessity, but through engineering achievements, improvements in operations, and well-directed sales efforts, prices for electricity are lower today than before World War II.

WALTER H. SAMMIS

Like many other industries, the early progress of the electric business was marked by the struggles, trials, and tribulations of devoted men to convince a doubting public of the advantages to be gained from the widespread use of the service. First came the inventor. Then came the always difficult and often insuperable task of financing unproven ventures. Simultaneously there followed, step by step, developments in electrical equipment manufacturing and in the design and construction of generating plants, transmission and distribution lines, operators to make the system work and salesmen to induce the people to spend their money for various types of electrically operated equipment to utilize the service. At the beginning, the financial man, the designer, the constructor, the operator, and the salesman were usually all one person. But these entrepreneurs set in motion a process of improvement and expansion that has continued to this day.

The operating engineers, stubbing their toes, barking their shins, and skinning their knuckles against hard physical facts, men keenly observant in diagnosing troubles, in seeing what could be improved and how to accomplish it, consulting with their colleagues in the business, applying cut and try methods, demanding improvements from the designers, both in the manufacturing establishments and in the power companies, eagerly seized each new advance in science, overcame hurdles, broke through or around barriers, and tackled new problems as they arose, with the determination to solve them. Undoubtedly, they were inspired by the philosophy of the great Edison, who said: "You know, I've been in the inventor business for over 33 years, and my experience is that for every problem that the Lord has made for me he has also made a solution."

It is a tribute to the essential faith of these early pioneers in the American way of business that they did not give up. The profit motive, of course, was a major factor in keeping them and their associates constantly at work overcoming obstacles, improving their products, and seeking widening public acceptance.

The past achievements of the electric industry are most gratifying to those who have had any part in it. It stirs one's pride of accomplishment. Pride of performance is commendable, providing we do not let self-satisfaction stop effort and that we do not relax under the false assumption that we have arrived and have no further to go. We have set standards of improvement that afford us no prospect of relaxation in the years to come in our efforts to serve capably.

"We Are Not Complacent"

After a year of duties that have brought me in contact with electric companies in many parts of the United States, I can say that as a group we are not complacent. We are striving to improve, to make further advancements, and to better our service to the customer.

We are convinced that we have before us the same opportunities for progress and the same need for struggle, courage, hope, and the will to win that Edison and his colleagues had. And we expect to be rewarded

for intelligent, sustained effort. At the same time, we also can expect vigorous opposition to every advance. We must overcome these obstacles just as the hardy pioneers did. We must overcome discriminatory legislation and discriminatory interpretation of legislation against the customers of the investor-owned utility companies.

I call to witness our outstanding progress in steam power generation, in transmission and distribution design and practice, all of which has helped to reduce the price of electric service. I also call to witness the spirit and steps undertaken by the investor-owned companies when there appeared on the horizon the possibility of an even lower-cost source of electricity through the use of atomic energy for power production. We have not minimized this new possibility. Our attitude is one of determination that as fast as science and engineering may make it possible for our customers to obtain more economical power from other new sources, we will do everything possible to make it available. This is evidenced by the many power companies that are actively engaged in research work in atomic energy.

Work With the AEC

Recently a number of power companies among others bid competitively for a contract with the Atomic Energy Commission (AEC) to build the first utility power plant that will use atomic energy from a nuclear reactor as a source of fuel. The Duquesne Light Co. of Pittsburgh was the successful bidder, and along with the AEC and the Westinghouse Electric Corp., is now embarked upon this program.

The Edison Electric Institute has pledged its co-operation to the AEC and urged the amendment of the present Atomic Energy Act so that, supplementing the Federal government's activity, investors with their money may speed the development and utilization of atomic energy for power purposes for the benefit of the public.

When I took office as president of the Institute, I stated I would at every opportunity make known to the American people the facts about the unfairness and the inequities of government power competition as they affect the customers of the investor-owned utility companies.

In talks and articles I have endeavored to fulfill this pledge. The experience in so doing has sharpened my understanding of the forces that motivate the actions of those supporting and those opposing the issues confronting our business. I would like to touch upon a few of the issues which appear to be the more significant.

Free Enterprise Preferred

People generally prefer not to be dependent upon the Federal government for their electricity supply. This preference has been revealed in nation-wide surveys. Apparently they have an inborn fear of the domination that can come from the Federal government as a result of being in proprietary operations on a large scale. Many believe that government proprietary business is a threat to all private business and that without private enterprise there cannot long remain political freedom and personal liberty. Evidently, the deeper and more widespread the Federal government's business operations become, the greater this apprehension becomes and the greater the people's desire to live under the philosophy of free enterprise.

The initiation and expansion of the Federal power business has practically always been tied in with the development of natural resources, and often with resource developments where the real benefits as compared with the true costs were doubtful, and in some cases clearly inadequate. The spending of Federal tax monies for such projects naturally has always had very strong popular appeal in the areas where the construction monies are to be spent.

Propaganda

The efforts to put the Federal government in the power business have frequently been preceded or accompanied by a flood of propaganda aimed at creating the impression that government can produce and sell electricity more cheaply, and that once the power plants have been completed the availability of so-called low-cost power will attract new industries and thus sustain additional payrolls and more business in the areas. These advocates, however, never divulge that industry rarely locates in any area because of low-cost power alone, nor that the so-called low-cost power results from subsidies made possible at the expense of the taxpayers in other sections of the country.

Propaganda has been for years disseminated skillfully, often by government officials, creating the fear of impending power shortage—the impression that investor-owned companies will be unable to provide adequate power for national defense—or creating the fear that the job of supplying the nation's power requirements is too big for private industry and the Federal government must step in.

Experience has taught us to regard all such statements with concern because, in general, they are designed to disarm the proponents and supporters of the free enterprise system. It is our duty to our customers, employees and security holders, all of whom pay Federal taxes—indirectly through their electric service bills and directly through income and other forms of Federal taxes—to inform them of the real facts and the harmful effects upon them of this propaganda and these claims.

Power Sales to REA Co-ops

Roughly, it appears that the bait used to extend the government's power operations was to price power at about one-half what the investor-owned utilities charge for the service, which was also about one-half of its true cost to the government. The latest REA purchased power report (for the fiscal year ended June 30, 1952) is one example of this. It shows that the various Federal power agencies sold electricity to the REA co-ops in fiscal 1952 at an average price of 4.9 mills a kilowatthour and that the price charged the co-ops by the private companies averaged 8.6 mills, whereas the average price charged the co-ops by REA generating stations was 13.7 mills.

You never see a government-owned power business or any other government proprietary business that is divorced from big subsidies. Why? Because stripped of subsidies it could not obtain or hold business—it would have no appeal.

Federal taxes are, of course, the big differential, the big subsidy. The customers of the investor-owned utility companies pay 13.7 cents of every dollar collected from them in their electric service bills for the support of the Federal government. This amounted to $809,000,000 in 1953. Incidentally, prior to 1932 it was less than 3 cents of every dollar collected. Customers of government power agen-

cies, on the other hand, are exempt from paying through their electric bills this share of the cost of the Federal government, as government power operations do not pay Federal taxes.

Another 8.6 cents of every dollar electric light and power companies collect from their customers goes for the support of state and local governments, but government power agencies make little, if any, payments in lieu of state or local taxes.

Equitable Tax Payment Advocated

You may recall the cry that went up at the time TVA took over the generation and transmission facilities of private power companies in the state of Tennessee. Some of the people of Tennessee strongly advocated that Congress should amend the TVA Act so that the Authority would pay taxes on the same basis as displaced private enterprise had been doing. The proposal was opposed vigorously by the late Senator Norris, father of the TVA Act, who declared, and I quote from the Congressional Record of April 13, 1939:

> "A proposal from a great association of Tennessee says, in effect, 'Let the TVA property be subject to taxation the same as everybody else's property.' On my desk now there is a printed amendment intended to be offered which provides that all property of the TVA shall be subject to taxation everywhere under the local laws of taxation. If we go to that extreme, Senators can see that the TVA would be out of business in three months."

TVA Pays Comparatively Little

TVA was, therefore, required to raise temporarily its percentage rate of payments in lieu of taxes, but present payments are far from being comparable with what the electric utility companies pay. In 1953, TVA's total payments in lieu of taxes were 3.26 per cent of revenues. Compare this with the percentage of 8.66 per cent to state and local governments by the investor-owned companies. The distribution systems in the TVA area also pay some "in lieu of" local taxes, but the total for the combined operation—TVA and its distributors—is only 4.95 per cent. A comparison based on mills per kilowatthour sold is even more striking: electric utility companies pay 1.7 mills per kilowatthour to state and local governments, TVA pays 14/100 of 1 mill, and the combined TVA-distributor operation pays 38/100 of 1 mill. And, of course, none of them pay Federal taxes.

Another subsidy I would like to mention briefly is that Federal government power operations escape paying interest or return on the capital supplied by Congress to build power facilities in some instances. You will recall that only a few weeks ago, when the House Appropriations Committee proposed that TVA should pay interest on the monies appropriated by Congress, supporters of TVA staged a frantic and successful pressure drive to kill the proposal, even though the suggested rate of interest was lower than the full cost of money to the Treasury. Why? According to press reports, Congressmen from Tennessee and Mississippi told the House Rules Committee this would cripple TVA.

The securities issued by government power projects other than Federal are also free from Federal income taxes and in many instances free from state income taxes.

True Costs Should Be Charged

To sum it up, if the Federal government with the monies of its citizens is going to compete with them in business, certainly it should be on an equal basis with investor-owned business, charging to such business the true costs of doing business, and not base its prices on subsidized costs at the expense of the customers of the investor-owned utility companies and other taxpayers.

The Federal government's power operations on a true cost basis cannot match our record. If the government included all costs in its prices for power, in practically every case the resulting prices would be greater than the market value of power in the same area that is or could be produced by electric power companies under the regulation of public service commissions controlling power company rates.

Charge of "Give Away"

In many instances, when utility companies have sought to obtain licenses to develop hydroelectric projects or to participate in the power portion of a multi-purpose water resource development, the advocates of an ever-expanding Federal power business have charged the investor-owned companies with attempts to grab or steal national assets. This is a "give away" of the nation's resources, they claim. This charge has been made in the case of Hell's Canyon, where the Idaho Power Co. is attempting to obtain a license to develop additional power on the Snake River. It was raised quite recently when five companies in the Pacific Northwest asked for permits to develop two projects on forks of the Clearwater River in Idaho. It has also been made in the case of the Niagara redevelopment, which five utility companies in New York State are prepared to undertake.

Public's Interest Protected

What can these power companies do with these assets other than to put them to work for the benefit of all of the people in the area, and by so doing add something to regional growth and prosperity and provide additional sources of tax revenues for the Federal, state, and local governments? Their systems are interconnected with the power supply systems of the area and are under regulation, so that the public's interest in receiving the full benefits from the power produced at all such projects is amply protected.

The position of this industry with respect to sound water resources development was clearly set forth by the Institute over four years ago in a presentation to the President's Water Resources Policy Commission. The statement of principles announced then is just as sound today.

Results of Excluding Utilities

The course pursued in the past of attempting to exclude the utilities from such participation has resulted in substantial additions to the nation's tax burden, needless duplication of expenditures, and discrimination against one substantial group of citizens (the taxpaying customers of the private utilities who constitute 80 per cent of the users of electricity) in favor of another and smaller group (the customers of government-owned power systems who pay little or nothing in the way of taxes in their electric bills).

Never at a loss for an issue, however, the propaganda theme more recently emphasized by the public power advocates is that both private enterprise and the Federal government are needed to develop power, that the job can best be done by both. At long last

this in itself is somewhat of a concession for them to make, but even this contention that both are needed is demolished by the remarkable record of the private power industry both during and since World War II.

A specific example of recent misleading propaganda is the preposterous claim that, if it had not been for TVA the production of the atom bomb might have been delayed two to four years and were it not for TVA's ability to produce an extraordinary amount of power for production of our own atomic bombs, atomic bombs would have been dropped by now on the United States.

Facts About Power Sales

The facts are that the kilowatthours sold by TVA to the AEC at Oak Ridge during the fiscal year 1944-45, the peak year of war production, were 6/10 of 1 per cent of the total kilowatthours supplied by the electric light and power industry, and the TVA's sales to all Federal agencies including the AEC during the same year were 8/10 of 1 per cent of the total supplied. During this same period the electric light and power industry had a reserve of generating capacity of 20 per cent.

TVA actually delivered 158,500 kw to Oak Ridge during the month of December, 1944, which represented approximately 3/10 of 1 per cent of the generating capacity of the electric light and power industry. By June, 1945, this percentage had reached a little less than 6/10 of 1 per cent, by 1949 the kilowatts under contract to Oak Ridge represented 4/10 of 1 per cent, and as of the present time, they represent approximately 1.8 per cent of the industry's generating capacity.

It was a high-ranking Federal official, who had to deal with power supply during World War II, who made the statement that "power was never too little, or too late."

Favorite Cry—"Power Shortage"

Another favorite rallying cry of the public power advocates is "power shortage." In spite of all the propaganda put out about it, this country has never known the meaning of the words "power shortage." One would have to be familiar with the experiences of other countries to find its meaning.

During World War II about 750,000 kw of generating capacity were taken by the Federal government from investor-owned utilities, some going to Russia, some going to industrial operations in this country for self-generation, and some going for the atomic energy program at Oak Ridge. A portion of this capacity was obtained by removing machines from the foundations in utility companies' plants in this country, the remainder by diverting equipment which the utility companies had on order with manufacturers. In addition, about 1,250,000 kw of generating capacity, which the utility companies had on order with manufacturers, were cancelled or deferred in manufacture until after hostilities, thus delaying by several years their completion and installation to and even beyond the time when the demand for power was mounting in the rapidly expanding postwar civilian economy.

And yet, despite this diversion of equipment, materials, and manpower, thanks to the ingenuity, the foresight, and the engineering and operating know-how of the people who man America's power companies, only occasionally have local power shortages materialized, and then for relatively short periods in particular areas. Usually they have resulted from drought conditions in areas heavily dependent on hydroelectric power. The growing percentage of steam generation in nearly every section of the country, coupled with the effectiveness of power system interconnections, has rendered these occasional local deficiencies less and less likely.

Record Since End of World War II

The record of the investor-owned electric power companies since the close of the last war in providing new facilities to meet the ever-expanding requirements of the nation is probably unequalled by any other segment of our economy. Total investment in their electric facilities has increased from a little over $12,500,000,000 in 1945 to about $26,500,000,000 today. According to the U. S. Department of Commerce, expenditures for new plant and equipment for all private industries in the country since the war have amounted to only slightly over $171,000,000,000, which indicates that the electric utility companies' expansion accounts for 1/12 of the total. Construction expenditures of the investor-owned electric light and power companies in 1954 are estimated to be about $3,000,000,000, the highest of any year.

Last year there were installed by all segments of the electric utility industry (investor, co-operative, and government-owned) 10,000,000 kw of generating capacity. At the end of 1953 the total generating capacity was 95,500,000 kw and reserves of generating capacity exceeded 17.6 per cent. The additions scheduled this year are about 13,700,000 kw and for 1955, 11,600,000 kw. Electric company managements will build generating capacity even more rapidly if the potential rate of increase in the use of electricity warrants.

No Need for Federal Money

It is obvious from the above that there is no need for the Federal government to appropriate money now, or at any other time, to assure an adequate power supply for this country. The Federal government, after spending many billions from the Treasury and taxing American business and the public to supply this money, is generating about 11 per cent of the nation's power production, including generation by industrial plants for their own use. Twenty years ago power production from Federal plants was only 3/10 of 1 per cent. At that time, and for years before, and again today the big job of the utilities was and is to find and create nonsubsidized markets for the electricity from the power plants they have built and are building.

Element of Fear Introduced

It should be plain that if the full responsibility were left to it, private enterprise would continue to provide this country with an ample supply of power for all needs at reasonable rates as determined by regulatory authorities. It's just that fundamental and simple. Where there has been any question on this point, it has arisen because the Federal government has divided and mixed the responsibility for power supply in certain areas and by its unfair taxation policy and its failure to charge its customers the full cost of producing power, has introduced an element of fear. There is genuine cause for the deep fear we have of the destructive force of government taxation. "The power to tax is the power to destroy."

In the case of economically justifiable multi-purpose water resource projects, the best over-all solution will

(Continued on page 186)

To the Memory of Thomas A. Edison

The Hon. Mark Anton
Member of the Senate, State of New Jersey

An address before the 22nd Annual EEI Convention, Atlantic City, N. J., June 1, 1954

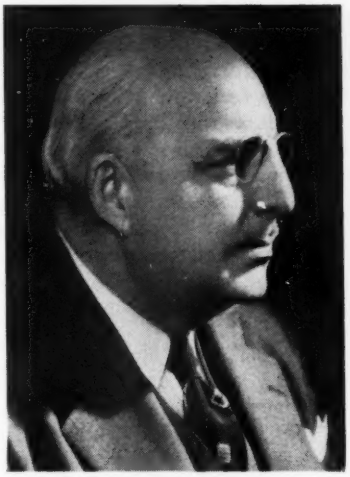
ALMOST a half a century ago a young boy, as the result of the remarriage of his widowed mother, was moved from Oak Park, Ill., to Essex County, N. J. At that time there were no youthful amusements, if not distractions, such as television, movies, or hot rods; so it was only natural that with his companions his interests lay in experimenting with things electrical.

A youth magazine of the time—*The American Boy*—had a department in which things of a scientific nature were reduced to elementary explanations. As a result, this boy constructed an electric arc light, a telegraphic set, built his own Alexander Graham Bell-type of telephone receiver and Edison carbon transmitter, last but not the least of his amateur achievements. With the aid of his buddies he constructed a wireless telegraph set, using a one-inch spark coil which he laboriously wound by hand. With the filings of a silver dime and an electric door bell he made a Marconi coherer which was the heart of his receiving set.

Inspired by Edison's Life

In his primitive exploration of scientific reading he was enchanted, enthralled, yes, indeed inspired by reading the "Life and Achievements of Thomas Alva Edison." Therefore, some of the resentment he felt over being uprooted and transplanted to New Jersey was alleviated to a great degree by knowing that he would be living in the shadow of the great wizard of Menlo Park.

His joy became unbounded when his new stepfather informed him that, through a mutual friend, he would be introduced to Mr. Edison. Therefore, shortly after his arrival in the East he was taken to the West Orange Edison Plant. He met Mr. Edison, who was most gracious to him, showed him through his library and laboratory, and talked to him at great length. I was that boy and all through life I have never forgotten



THE HON. MARK ANTON

Mr. Edison's admonition that "Nothing is ever a failure—and the tests and experiments that fail are not failures, but successes inasmuch as they prove that something won't work."

So it is that I am most happy to pay tribute to the greatest citizen the County of Essex—the county I represent in the New Jersey Senate—has ever known. Nearly all my life I have lived in Essex County, N. J., where, for the greater part of his lifetime, Thomas A. Edison lived and worked. You recall the names—Newark, Menlo Park, Llewellyn Park, Harrison, and West Orange.

You, all of you, have special cause for pride in the name and in the heritage with which your great industry forever will be associated. You can understand, therefore, the special pride of a New Jerseyman that it was in the Garden State of our nation that the most usefully fruitful mind of our time, perhaps of any time, chose to make his home and, in his own philosophy, "work—bringing out the secrets of nature and applying them for the happiness of men."

What shall we say of Edison? What can we say that has not been said before? What manner of man was he whom we have gathered here to honor today in this 75th year of the incandescent lamp?

I doubt that any man in the course of his lifetime ever received, or more justly earned and deserved, homage, honors, encomiums, tributes, yes, and simple tokens of affection equal to those bestowed upon Edison.

With no formal schooling, he was the recipient of numerous honorary doctorates from institutes of higher learning throughout the world. He was honored by his own government and many foreign sovereigns and governments with the highest civil decorations. He was distinguished by numerous national and foreign scientific societies and academies with honorary memberships and medals. He was the subject of countless learned and popular discourses, articles, and books; his name was upon every tongue.

Early called the Wizard of Menlo Park, the descriptive appellations bestowed upon him would fill pages. I shall name only a few: genius; manifold inventor; electrical wizard; pioneer—trail blazer; manipulator and exploiter of natural forces for the good of man; master of applied science; developer of modern scientific research methods; best informed man in all fields of human knowledge; and greatest of the giants who have made the modern world.

Tributes to His Genius

"Seer, Wizard and Master of the forces of Nature," he was denominated by Nicholas Murray Butler in 1915. In the same year President McLarin of Massachusetts Institute of Technology called him "a splendid example of scientific pertinacity rarely, if ever, surpassed in the history of human achievement," adding that "for a generation" he had been "an educational institution of first rank."

Indeed, the most distinguished men of Edison's time, paying tribute to his unparalleled contributions, raised a mighty chorus of praise for his qualities as an inventor and as

a man. "Noble, kindly servant of the United States and benefactor of mankind" was the accolade of Calvin Coolidge, when the Congressional Gold Medal was presented to Mr. Edison in 1928.

Herbert Hoover said of him: "The governments of the world levy upon upwards of sixty billions of wealth founded upon electricity." This was 25 years ago. Who would venture an estimate today? "But," Mr. Hoover continued, "the taxes and the new wealth are not Mr. Edison's major accomplishment, nor the major accomplishment of men of his genius. They are the rivers of sweat saved from the backs of men, and the infinite drudgery relieved from the hands of women.

"Every American owes a debt to him. It is not alone a debt for the great benefactions he has brought to mankind, but also a debt to the honor he has brought to our country. By his own genius and efforts he rose from modest beginnings to membership among the leaders of men and his life gives inspiration and confidence to every youth in our land, that the door of opportunity still stands open.

"And," Mr. Hoover added, "our civilization is much like a garden. It is to be apprised by the quality of its blooms. In degree as we fertilize this soil with liberty, as we maintain diligence in cultivation, and guardianship against destructive forces, do we then produce these blossoms, the fragrance of whose lives stimulates renewed endeavor, and gives to us courage to renewed effort and confidence for the future of our country."

Modest and Unassuming

Such superlatives as I have quoted, although undoubtedly appreciated by Mr. Edison, had little effect on either his personal way of life or his methods of work. He remained till the end of his years a modest, unspoiled, and unassuming man. Flattering though the tributes of a grateful world might be, Edison preferred to devote himself to his laboratory experiments with tireless persistence rather than to give up his work to receive honors, meet distinguished people, or attend public functions.

An invitation to receive a degree from a great English university, coming at a time when he was deep in experiment on his storage battery, was respectfully declined, since it would interrupt his work, if only for a few weeks. A visitor to his laboratory, in full regalia of silk hat and frock coat and bearing a gold medal from a foreign society, presented his tribute to a rather dirty and disheveled Edison who had reluctantly left an important experiment to receive this honor. On still another occasion, after receiving a medal in New York, Mr. Edison forgot it on the ferry boat and left it behind him.

It was truly said that he was an "indefatigable worker, with the imagination of a poet, a man of the simplest tastes, untiring searcher after truth, altogether a charming personality, patient, affable, always optimistic."

Quality of Persistence

Defining genius as "one per cent inspiration and 99 per cent perspiration," Edison himself declared that "in working out an invention the most important quality is persistence. Nearly every man who develops a new idea works it up to a point where it looks impossible and then he gets discouraged. That's not the place to get discouraged, that's the place to get interested. Hard work and forever sticking to a thing until it's done are the main things an inventor needs."

The success of this philosophy is borne out by even a partial listing of Edison's inventions—the quadruplex telegraph, the commercial adaptation of the telephone, the incandescent lamp, the many necessary appurtenances of his generating and distribution system, the storage battery, the phonograph, the development of moving and talking pictures, and literally thousands of others—which in less than a century have revolutionized our way of life. The solutions to the problems involved in the successful completion of each of these inventions were never easily attained, but the man's indomitable will and ingenuity conquered all obstacles.

Disregarding failure completely, or using it as a lesson of what to avoid in the future, he sometimes made thousands of fruitless experiments before attaining the desired result. In the case of the incandescent lamp, Edison reported: "I speak without exaggeration when I say that I have constructed 3000 different theories in connection with the electric light, each one of them reasonable and apparently likely to be true. Yet in two cases only did my experiments prove the truth of my theory."

Possessing as he did an extraordinary capacity for hard work, an impressive endowment of perseverance and the zeal which accompanies complete dedication to one's work, Edison inevitably communicated to his assistants much of his own enthusiasm, prompting one biographer to comment, "I doubt if there is a man living for whom his men would do so much." Edison selected his men carefully, examining their character and ability with probing questions. Once hired, the apprentice might be set to the humblest manual tasks, testing his humility and aptitude, or assigned a complicated mechanical test which challenged all his ability. Above all, however, the great inventor demanded complete devotion to the task at hand, with no thought of rest or relaxation till the desired result was achieved.

He made enormous demands, it is true, but never upon others more than upon himself, and was thoroughly kindly, sympathetic, and understanding. Visitors to his laboratory reported with affection scenes of Edison sitting on the corner of a table chatting and laughing with the office boy, or of midnight suppers in the laboratory, when Edison would call a halt to the long, weary hours of experimentation for refreshments, a few good stories and jokes, and perhaps a couple of songs to the tune of a mouth organ or zither.

Devotion of Employees

As a member of Edison's staff summed it up: "Those who were gathered around him in the old Menlo Park laboratory enjoyed his confidence, and he theirs. Nor was this confidence ever abused. He was respected with a respect which only great men can obtain, and he never showed by any word or act that he was their employer in a sense that would hurt the feelings, as is often the case in the ordinary course of business life. He conversed, argued, and disputed with us all as if he were a colleague on the same footing. It was his winning ways and manners that attached us all so loy-

ally to his side, and made us ever ready with a boundless devotion to execute any request or desire."

All of Edison's inventions were aimed at the practical goal of making life easier, more convenient, more enjoyable for his fellow men. He had little interest in scientific theory or the discovery of scientific principles for their own sake. Rather, his chief concern was with those devices and applications which would be directly advantageous to humanity in terms of practical improvement of life and the means of living.

Changes Wrought by Electricity

As we consider the transformations which stem directly and indirectly from the invention of the incandescent light and the utilization of electric energy, we feel that the world owes him a debt which cannot be measured or overestimated. And I include, with all sincerity, all of those who are in a sense competitors with the industry with which his name and his contributions are most closely associated.

It was noted, as long as 25 years ago, by another Jerseyman, that "There are a thousand functions now being performed for us by electricity that in the days of our fathers involved hard manual labor and an expenditure of time that made working hours long and playtime short. There is no better way to secure a realization of the changes that electrical development has wrought than to review one's personal activities during even a single day and note how they are affected by the various applications of electrical energy to one's needs — the electrical appliances that perform for us so many household tasks, the electric car or train that carries us to our places of business, the electric elevator that makes possible the skyscraper in which is located our office, the electric machinery that enters into the manufacturing processes that provide for our various requirements, the use of electricity in our hospitals and by our doctors and dentists, the telephone that is at our elbow as we work, the radio (or television) that may furnish our evening's entertainment if we do not patronize the moving picture house or the theatre, where, too, electricity plays an important part, the electric light that not only gives us necessary illumination, but contributes new beauty and new grace wherever it is used—these and many more applications of electricity attest the almost revolutionary character of the change that has come over our manner of living since Mr. Edison completed his work upon the electric lamp."

It does not detract in the least from Edison's accomplishments to say that electric service, and much that has sprung from it, would have come to the world, later most certainly and not in the same manner most likely, if Edison had never lived. But he did live and he did lay the concrete, physical, measurable foundation for the development that is being celebrated during this year of Light's Diamond Jubilee.

In this endeavor he was not alone. We, like others before us, acknowledge that "It was not enough that Mr. Edison should have perfected an incandescent lamp—should have put in operation the Pearl Street Station. Unless there had been scientists to devote their lives to laboratory and mathematical research, unless there had been inventors to apply the abstract principles thus discovered to practical utilization, unless there had been business men with vision wide enough and with optimism strong enough to foresee the commercial possibilities that lay ahead, we would still be living in the age of our fathers and the economic and social progress of the past fifty years would not have taken place."

Far-Reaching Effects of Development

As has been well said, "That development, founded on (Edison's) lamp and his electric system and enriched beyond measure by the contributions of other pioneers and by countless engineers, scientists, financiers and men in many walks of life, has been continuously progressive, and goes far beyond the electric light and power industry itself.

"The roots, branches, offshoots and effects of the development include the numerous extensions in all fields of science, engineering, and the useful arts that would have been impossible without an abundant supply of electricity.

"They also include the great extension of the country's wealth through (1) the broadening of employment opportunities for an uncountable number of people; (2) the creation of new enterprises, and the revivification of elder ones; (3) their influence on capital investment and earnings throughout the national economy."

Although electricity in many cases assumed the burden of work formerly performed laboriously by hand or by relatively inefficient machine processes, it also broadened employment and business opportunities immeasurably by the creation of new products and new fields of activity. As far back as 1940, it was estimated that "one out of every nine people gainfully employed in the United States in all the transportation, communication, and mechanical industries (owed) his employment directly to the inventions of Thomas Edison."

Influence on Employment

Today the number of persons whose employment has been affected includes not only those working in the power industry itself and in the electrical manufacturing industry, but also those workers employed in industries made possible by the coming of electricity—radio and television come to mind immediately—or those in which production processes depend wholly on electric power, or a still greater number of companies in which its applications are found in varying degree.

An effective reflection of the impact of Edison's invention on our economy is found, therefore, in the number of industries which are directly or indirectly dependent on electricity for their very life. The electric equipment and appliance manufacturing industries, the radio, television, motion picture, and phonograph industries were, of course, created by the development which Edison initiated and continued to advance throughout his long and productive career. Other industries received new life and achieved unprecedented records for output and efficiency by the application of electricity to various processes of production.

The steel, copper, and aluminum industries, for instance, have greatly increased their contributions to our civilization; the airplane and automobile industries have achieved miracles of mass production; communications and transportation have advanced to a degree which makes

the methods used in 1879 seem primitive by comparison. In fact, almost every phase of our modern economy —industry, agriculture, mining, commerce, even science and medicine— has been transformed to a greater or less extent by the miracle of electricity. And in the future we may confidently expect to witness even more drastic changes than have occurred in the past 75 years. Electric power will be a major instrument in realizing to the fullest extent the potentialities of atomic power, which could not have been harnessed initially without an abundant supply of electricity.

Finally, the influence of electric development on the expansion of national wealth is evident not only through the processes of capital investment and earnings in the financing of the light and power industry and the electrical manufacturing industry, but also in its contributions to such factors as manufacturing processes, housing, business operations, administrative techniques, record and billing operations, and communications and transport. These are reflected favorably in the financial and investment record of most companies, and thereby in the national economy. In the field of real estate alone, electric power has greatly increased land values and enabled urban centers, with their huge skyscrapers and their electrified transportation systems, to be built and to function.

It is obvious, then, that among the American people, there are few indeed who have not reaped the benefits of an easier, more enjoyable, more profitable existence because Thomas Edison lived and worked and achieved so much, and because those who followed him continued the development which he started.

One of Edison's most significant qualities was an ability to concentrate his attention wholeheartedly on the future. In his own words: "Spilt milk doesn't interest me. I have spilt lots of it, and while I have always felt it for a few days, it is quickly forgotten, and I turn again to the future . . . I don't live with the past. I am living for today and tomorrow." Like Edison, we must focus our eyes on the future, using the tools he placed in our hands to bring about ever-increasing benefits and services for all mankind.

The President's Address

(*Continued from page* 182)

come when private enterprise is given full opportunity to participate in the development with an equitable distribution of responsibilities accorded each function of each project.

I am sure that the investor-owned companies have been encouraged by the participation policy announced by the present administration and outlined in speeches by responsible officials of the Department of Interior. Certainly the power companies will be found anxious, willing, and able to do their part.

But the enemies of free enterprise are skillful, aggressive, persuasive. They will continue to invent new issues. We must be prepared to meet them. The pioneers of this industry, too, were beset with many problems and opposition. Despite ridicule and skepticism, by dint of hard labor they justified the trust of their associates and financial backers and brought the age of electricity to the world. We must be equally resourceful.

A Clear Course

Our course in the face of the opposition is clear. The true interest of the public must be the compass to guide the course of management. We must give good service to our customers in both the narrow and broad sense. Adequate electric power at the lowest possible price consistent with a fair return on the value of our property of itself is not enough. There is a broader concept of service to which we must further contribute some of our talents and efforts. We should further utilize our great planning and administrative abilities for sound community betterment and area growth, for fostering industrial development, and for improving those things that go to make the "home town" a better place in which to live. Progressive, enterprising, understanding, tolerant—we must truly be "a citizen wherever we serve." This calls for able leadership and a sound program to go with it.

I realize that there is a limit to how far we can go in matters of this nature, but certainly the electric companies are well equipped to help in such endeavors to the benefit of all segments of the economy.

One more thing, and it is important—we must keep the public informed of the facts about our business. The road blocks we face will in the final analysis be resolved, as all such problems are resolved, in the court of public opinion. You may have told your story time and again, but it needs to be told continuously. We are so apt to forget that our audience is constantly changing and that it is too concerned with its own personal affairs to remember much of what we say.

In conclusion, I ask this question: Is this country going to continue to place its reliance in the free enterprise system? The record shows that as far as the production of electric power is concerned, the American people can wisely and safely entrust this business to private enterprise. If such is their verdict, and I am confident it is, the policies of the Federal government should be shaped so as to help, and not hobble, the private utilities. I am sure that when all of the facts are thoroughly understood by our citizens, they will come to but one conclusion on the basis of 75 years of experience, namely, that the Federal government should not engage in the generation, transmission, and distribution of electricity in competition with the investor-owned electric utility companies.

New Food-Freezer Booklet Available

"Food Freezing Facts," a new consumer booklet telling how to prepare and use frozen foods, is now available from the Institute.

Compiled by the Home Service Committee, the 32-page booklet is designed to meet the electric company need for a simple answer book on home freezing. Besides general instructions on preparing cooked and uncooked foods for storage, "Food Freezing Facts" includes tips on freezing and planning menus with frozen foods. It is printed in two colors with attractive drawings.

Samples of the booklet and further information, including quantity prices, can be obtained upon request to the EEI Commercial Department.

The Meaning of Light's Diamond Jubilee

Charles E. Wilson

Chairman, Light's Diamond Jubilee Sponsoring Committee, and President, Edison Pioneers

An address before the 22nd Annual EEI Convention, Atlantic City, N. J., June 1, 1954

IT has become quite the thing, as you may have noticed, to celebrate anniversaries in America. Thus, in 1954, America is being called upon to commemorate the tricentennial of New York City and of Columbia University, the 100th anniversary of the first American meeting of the YMCA, the centennial of the peace treaty opening Japan to the outside world, and the golden anniversary of the opening of the New York subway.

It came to me with something of a shock recently to realize that this whole business of marking anniversaries has become so major a part of our lives that there is at least one fairly sizable enterprise that specializes in nothing else than the organizing and conducting of anniversary celebrations. It will come in and stage your pageant for you, prepare buttons for lapels, print up posters, booklets and appropriate ribbons, instigate beard-growing contests and other interest-stirring schemes, and in other ways blow the event up into provocative proportions.

Not Opposed to Celebrations

I am not opposed to all this. In a country as young, as energetic, and as enthusiastic as this one is, it seems to me altogether normal and healthy—and inevitable—for groups of citizens to become excited by the discovery that 50, or 75, or 100 years have passed since a first foot was set upon, or a first house built upon, or a certain action taken on a given piece of revered soil by one of our predecessors.

Europe, smug in its antiquity, may smile at us and may let pass by, with hardly a notice, events out of history that would be the occasion here for bunting and fireworks. To this we can only shrug and say that we are different. I, for one, am glad of the difference.

But all of this does behoove us, it seems to me, to ask ourselves in the springtime of this year in which we are expending so much effort in behalf of an anniversary, just why Light's Diamond Jubilee is important to us. What, in short, is the meaning behind it?

CHARLES E. WILSON

In insisting that America pay heed to Light's Diamond Jubilee we are, first and foremost, asking a hurrying nation to pause for a moment in recognition of one of its truly great figures, Thomas Alva Edison.

Any pageants we stage in our efforts to rekindle the public's memories of Edison will be like a ritual, reaffirming facets of knowledge that are already fondly embedded in the public consciousness. The high points of Edison's story are a part of common knowledge: his experiments at Menlo Park . . . the tireless trying of different filaments, from strips of paper to a hair from John Kruesi's beard . . . the final success with carbonized cotton thread . . . the 40-hour-long "death watch" before that first lamp finally burned out . . . and Edison's own triumphant summation that "If it can burn 40 hours, I can make it last 100" . . . these are all established elements in our folklore.

But there is so much more than these to the Edison story! Edison himself was so much more than a kind of romantic Daniel Boone on the new scientific frontier. It seems to me tremendously worth while for us to conceive of Light's Diamond Jubilee, at least in part, as an occasion for deepening and strengthening the understanding that America has of this great man in her past.

Dr. Willis R. Whitney, past Director of the General Electric Research Laboratory and an old friend of mine, tells of being asked "Wasn't Edison a mere inventor and no scientist?" The thought bothered Whitney so that, characteristically, he conducted extensive research into the life of Edison to satisfy himself on the point.

His conclusion was that Edison deserved fully to be classified under both titles. "No man," Dr. Whitney says, "has done more successful work in chemistry, physics, and electricity than Edison." He cites Edison's many experiments with chemicals, his little-known efforts in applying the principles of physics to rock-crushing, belt-conveying, and cement-producing equipment. He likes to tell about Edison's interest in entomology, the science of bugs, and how, out of this interest, Edison came to coin the word "bugs" for faults in electrical equipment. "Nowadays," Dr. Whitney says drily, "electrical bugs are more influential than any other kind."

Put Inventing on New Level

I find it interesting to dwell on the thought that Edison fathered our present-day system of organized research. Unlike earlier inventors who experimented more or less haphazardly, Edison set up a plan of experimentation and study—and then employed a team of men to work toward common goals under his guidance as leader. His method placed the field of inventing on a new level. From his beginnings, inventing became a business that involved staffs of men

working full-time, on a career basis, in well-equipped laboratories.

I mention these brief examples merely to indicate how the public impression of Edison can be, and needs to be, heightened. In undertaking this project in connection with Light's Diamond Jubilee, we are, I feel sure, undertaking a good work, and one that is in imminent need of doing.

Beyond this important goal of placing a more life-size and more rounded picture of Edison in the public mind there is another reason why, I believe, we should lend our best efforts to the support of Light's Diamond Jubilee.

Edison's 1929 Statement

This is the fact of the tremendous impact that the development of three quarters of a century ago has had upon our life. Edison himself, looking back on that moment from the vantage point of Light's Golden Jubilee in 1929, had this to say: "I must confess that I never dreamed that from the incandescent lamp would come the stupendous electrical industry of today."

Yet he took the best possible precautions, back there in his youth, to make sure that this dream would be realized. He did not conceive of the invention of the lamp as an isolated achievement but as part of a continuing process. He saw from the beginning that the lamp was only one element of a unified electrical generating and distributing system. The system he devised was the foundation of the electrical industry.

Great Transformations Effected

It was more. I do not think we reach too far in interpreting that achievement as a transformation in our civilization itself. It broadened the horizons of the industrial revolution almost infinitely. It set off repercussions that have meant whole new industries, basic changes in the ways of getting the world's work done, fundamental changes in our lives and creature comforts.

The chain of events touched off at that time was truly international in scope. This was recognized 25 years ago when, in celebrating Light's Golden Jubilee, ceremonies were held not only in Atlantic City, at Niagara Falls, at Dearborn, in Cleveland, and elsewhere throughout the nation, but also throughout Europe, in South America, and in Japan.

It should be apparent, therefore, that in drawing the attentions of Americans to an observance of this anniversary we are concerning them not with an event of local or special interest but one that is truly international in its significance and universal in its appeal. We should not be in any way apologetic for whatever of the time and attentions of our fellow men we can command.

Finally there is the fact that Light's Diamond Jubilee provides a focal point for concentrating public attention on the achievements of our electrical industry. There is a guiding principle among the more conscientious public relations practitioners that goes: do right and then get credit for it. Those enterprises that make up the electrical industry have, as I am sure you will agree, been doing right both individually and collectively. This is not a golden but a diamond opportunity to reap some of the credit and the good will that are so richly deserved.

Criticisms Squelched

It does not seem so long ago that I stood before an EEI Convention and discussed the fact that there were critics in some quarters who were croaking dismal predictions of an electric power shortage. Whatever happened to that line of foreboding? It was simply buried under an avalanche of new power stations, new investments in plant and equipment, new developments in more powerful and efficient generating and distributing equipment. It was swallowed up in the rush of electric utility companies willing to bet their funds on America's increasing demand for electrical energy.

Whatever we can do in Edison's name to gain deserved recognition and credit for the electrical industry's contributions to our national welfare, he would, I am sure, heartily endorse and applaud.

This is a particularly appropriate time to press home a greater awareness of the desirability and advantages of better lighting. Lighting was the industry's first service and is still the great common denominator. The Jubilee gives us reason to rededicate ourselves to intensified efforts to bring the vast benefits of proper lighting to increasing numbers of the world's peoples.

Much of what I have been saying has already been crystallized in the slogan that has been selected for the Jubilee. This proclaims "Light for Freedom—Power for Progress."

"Light for Freedom"

In spreading the story of what our industry means to the world, we have a peculiarly appropriate asset in the word "light" itself. "Light" has always symbolized freedom, as it does in our own Statue of Liberty, lifting her lamp beside the golden door. "Light for Freedom"—it's questionable whether even a man of Edison's talents could have overcome the problem facing him in an environment that restricted his freedom of thought and inquiry and channeled his thinking into dogmatic, politically dictated patterns. The fact that he filled 200 notebooks, each of 300 pages, with data on experiments reveals how far-ranging were his researches into practical lighting problems.

"Power for Progress," the other half of the Jubilee slogan, sums up the points I have been laboring to make concerning the world-wide significance of Edison's achievement. There is certainly no need to dwell at length on the correlation between the development of our electrical industry and this nation's progress. This is a story that is as familiar to us as the palms of our hands. Our problem is simply to make it equally as familiar to our fellow citizens.

Jubilee Committees Active

For the various reasons I have outlined here I am prepared to say, "More power to those who have taken on the responsibility of carrying out the Jubilee program." Our good friend Don Luce of Public Service in Newark is sitting at the helm of the all-industry committee, and you see evidence at every turn of the work that committee is doing: Ralph Wagner of Niagara Mohawk up in Albany has his electric service company committee working wonders: and "Robbie" Robinson of my alma mater is heading the indus-

(Continued on page 192)

Selling for the Future Load

Sherman R. Knapp

President, The Connecticut Light & Power Company

An address before the 22nd Annual EEI Convention, Atlantic City, N. J., June 1, 1954

IT is my assignment to talk about "Selling for the Future Load." Certainly, there is a good deal of rubber and air in such a title, and I feel like a man with wet hands grappling with a soapy balloon.

This whole topic of selling is so large, so round, so fully packed with thoughts, theories, and viewpoints that it is hard to get agreement even among those who consider themselves sales-minded. There are few topics that enclose more resounding arguments, erroneous convictions, and plain hot air.

To hear businessmen of all breeds talk, you would think that the American salesman had vanished from the face of the earth. Yet the sales figures of product after product continue to climb.

What this country needs, we are told in thousands of speeches and editorials, is a return to good old-fashioned salesmanship. More thumbs on doorbells. More, and presumably louder, sales meetings. More shoe leather rubbed off on bricks. More phone calls, follow-ups, push money, premiums, point-of-sale displays, banners, streamers, and gaudy gimmicks.

A Use for Each Selling Tool

Maybe. There is a use for every tool in the kit, or it wouldn't be there. But, as in the practice of medicine, the art of selling is sometimes confused with the tools. It takes more than an office full of instruments to make a good doctor. It takes more than good salesmen—although a few more would help—to create the modern sales program that deals with attitudes and satisfactions.

The other day at lunch I was discussing my assignment with a man who heads what he calls a "merchandising" business. The company makes a packaged consumer product; it has a relatively small factory, a big sales force, and what seems to me a fantastic advertising budget. I told my friend I was looking for ideas and principles that might be useful to power companies in their selling for the future market.

SHERMAN R. KNAPP

I have to report that my friend snorted in amazement. He could not believe that a power company had anything remotely resembling a sales problem. "Why," he said, "everybody has to have electricity; they can't buy it anywhere else; so what else do you have to do but make the stuff and read the meters?"

I suspect he is not alone in this belief, even in our own industry. I have met some engineers and operating men who seriously consider customers an unfortunate nuisance—and ungrateful to boot. On occasion, it is tempting to agree.

A customer, as we all know, can be a very annoying fellow. He never thinks a bill is too low, or even reasonable. He can hook up enough heaters, toasters, and curling irons on a single circuit to fry an ox and then complain that 15-amp fuses aren't what they used to be. He can also be a very rewarding fellow—and anyway, he's all we've got. So we ought to get to know him better.

In Connecticut we have learned some things about customers that I think are significant. We are in a high-cost area, which makes for relatively high rates. We are, we think, sales-minded, which makes for relatively higher use of electric power. The average use by our electric household customers last year was 2598 kwhr—well ahead of the national average. Our average residential monthly bill was $6.52, compared to $5.35 average for the industry, and one of the highest in the country.

Against this background, it is interesting to know that we have found that what we call our high-use customers are not only our best customers revenue wise—they are also the low-trouble customers. For us, a high-use customer is one who has an electric range and hot water heater, as well as the usual lighting and appliances. It has little to do with the size of his pocketbook or the size of his house. It has to do with his full use, and thereby full appreciation, of electric power.

Furthermore, there seems to be a parallel between the high-use customer's value as a consumer and his substance as a citizen. He is more likely to pay his bills promptly. And, as a recent spotcheck indicates, he is quite likely to be one of our 40,000 stockholders.

High-Use Customers

So, when we talk of selling for the future market, in our company, we are concerned with more than kilowatthours. We are thinking in terms of creating customers rather than sales, of developing more high-use customers who, because of their investment in electric living, and their reliance on it, have more in common with their power company. It seems reasonable to believe, also, that the high-use customer, with a higher mutual interest, is more likely to share the company's economic beliefs. At any rate, we love him dearly, and our sales thinking is hinged on winning more like him.

Of course, even in our own company, and certainly in our own industry, there are those who, like my merchandising friend, are still not sold on the need for selling in a public utility operation. We have all seen from time to time the beautifully presented prognostications of our partners, the electrical manufacturers,

showing how much the load is going to grow in the next ten, 15, or 20 years. I have been afraid sometimes that there is a tendency for us to become complacent in the false belief that our industry's future growth is in no way related to our policies and efforts.

I am not going to argue the point, but I would like to say with all solemnity that I know of no product, no cause, no idea that has won public understanding and acceptance without that force of active belief variously called selling, or merchandising, or promotion.

Electricity, a Packaged Product

Electric power, for all practical purposes, is a packaged product. It is not enough merely to make it available. The package must be opened, the switch snapped, before it can be consumed and paid for. If, as an industry, we are to load up the capacity now being installed and planned, I think we shall have to demonstrate with selling action our belief in what it can do for our customers, whether they are housewives, farmers, storekeepers, or manufacturers.

Selling Ideas

The kind of selling I mean is an attitude—a company attitude in which everything the company is and does contributes to its selling, in which everything the company sells contributes to the company and the economy. Mainly this means selling ideas. Selling, in this sense, is nothing separate and apart. It has its techniques and tools, to be sure, but above all it must express a total belief and approach. It includes the company's standing as a citizen in its community, its work to improve and serve that community.

In our company, it includes the yellow trouble trucks and the linemen's helmets with the block letters "CL&P," as well as the company's successful efforts to create the Connecticut Development Credit Corporation. It is the newly remodeled stores in the old towns and the manners and public helpfulness of the meter readers. It is advertising and a tree control program. It is also salesmen.

There will always, I hope, be salesmen. Person-to-person selling was directly responsible, I feel, for the initial expansion of goods and services in the early decades of the century. The vacuum cleaner salesman, the magazine subscription and book salesmen, yes—the automobile salesmen, lately invisible—the stock salesmen of sometimes regretful memory, and, of course, the insurance salesman famed in cartoon and story. Probably all of us here should recall the insurance man with gratitude. How much insurance would we have bought if the insurance man hadn't worked us over and kept after us with every approaching birthday, every new baby?

No, personal selling isn't dead. It just looks that way in too many stores suffering the transition from service selling to supermarket buying. Part of the picture is the shift in emphasis from selling to buying.

You want to buy a hammer, so you go into a hardware store. You look for the hammers. Only if you don't see what you want you look for a salesman, so-called. You tell him you want a hammer. He says, "They're right over there somewhere." He follows you over—maybe. You check the price tags and pick up a medium-priced hammer. You ask him if it's a good one. He says it's a mighty good hammer; they sell a lot of them.

Does he say, "Well, sir, that's a good hammer for the price, but just heft this one for only a dollar more. This is the one the carpenters buy. It has a heat-treated head that can't come off, and the handle is made of long-grain hickory preseasoned with human sweat." He does not. Yet, who are we to talk? Only undertakers have a lower business mortality than hardware stores!

Example of Good Salesmanship

On the other hand, I recently heard of a hardware store out in the prairie dog country that is run by a real salesman. Once, he saw a car go by with a plank sticking out the back. He ran out, caught the license number, and later that day sold a surprised homeowner a two hundred dollar power tool. The same fellow leaves catalogues and manuals for that particular tool in barber shops. He gave two copies of a five-dollar book about power tool woodworking to the local library, makes regular visits to take off the cards the names of those borrowing the books. He had sold three of them at last account.

Actually, he didn't sell those power tools. He sold an idea by selecting men who were in the mood for some electric woodworking around the house. He showed them how to use the tool, how to pay for it by saving money while using it. In effect, this real salesman made it easier to say "yes."

Perhaps this is the significant difference between the old and the new personal selling. The oldtime salesman knew his techniques, by which he made it harder and harder to say "No." The modern salesmanship, in person or in print or at the point of purchase, makes it easier to say "Yes."

Change in Selling Methods

I certainly think we could stand more and more intelligent, person-to-person selling at the retail level. But, today, person-to-person selling is only one of the means to the over-all objective. The supermarkets sell more spices and housewares than all the Yankee peddlers. The book clubs sell more books, by giving away encyclopedias, than the foot-in-the-door boys even dreamed about.

The principles of good salesmanship, fitted to the needs and ultimate interests of the customer, have not changed. But the methods of selling have changed as the aims and costs of selling have become relative to the over-all goals and operations of business.

"Suction Selling"

For one thing, pressure selling (often called high-pressure selling) has given way to what you might call "suction selling." In this, the sales effort is less in going out after customers than in getting them to come in. Examples, painful in some quarters, are savings bank life insurance and lower-cost, mail-order automobile insurance. The book clubs I mentioned are another example, as are the supermarkets that are the new Great White Way across the whole country.

This trend to suction, rather than pressure, selling is part of the growing and imperative necessity to cut the costs of distribution. The dollar distance from the factory to the purchaser is often far greater than the distance from the raw materials to the finished product at the end of the production line.

Too many products simply cost too much to sell. For some products, the pennies saved in the factory have literally become the only pennies earned. For others, the economies and efficiencies achieved in modern design and manufacturing have been swallowed by the rising costs of distribu-

tion in the old market patterns. In such companies, the old joke about, "We lose money on every item but make it up in the volume," is no joke —even when it's called "profitless prosperity."

Whenever the distance from the factory to the cash register gets too great, somebody's going to find a short cut. We may view the discount houses with alarm, but indignation will not wipe out the facts of their existence. In a harshly realistic sense, they are part of the process of adjustment. They do not create the situation; rather, they illuminate it. They dramatize, in the selling field, the same situation that is easily recognized in the manufacturing field when production costs show the overload of obsolete methods and equipment. We know what always happens in this situation; somebody makes a cheaper ding-dong. And when obsolescence sets in, rigor mortis is not far behind.

Shift in Buying Habits

One example of this obsolescence that has become increasingly obvious to us is the gradual shift in the buying habits of the small-town residents from their community stores to the big stores in the cities. Better roads, more automobiles, and the natural aggressiveness of the big-time merchandisers are positive and powerful factors in this shift. But the negative, "What's the use?" attitude of the small-town merchant has also been an accelerating force in this trend. Since we are more of a rural than an urban company, we took a dim view of this buying power flowing from our service area to that of our city cousins, much as we love them.

Plan of Action Developed

We had been preaching and, to some extent at least, practicing the gospel of area development and community improvement for quite a while. Up until a year ago, however, no way had come to our attention of putting these ideas to work to help our commercial customers retain the business that was naturally theirs. Certainly, here was an opportunity to demonstrate how we could help ourselves by helping others. A plan of action was developed by the late Bob Ely, who was then sales vice president, and this plan was carried out under his direction last fall.

It started off with an analysis of how much business was being lost by merchants in the smaller communities. When the facts developed from this analysis were shown to local Chambers of Commerce, we had little difficulty in enlisting their cooperation. Surveys were made of local residents to determine what they didn't like about their community stores and what should be done to improve them.

Next Step: Organizing Conferences

The next step was to organize, in eight areas of Connecticut, conferences attended by several hundred merchants and businessmen. They were told that millions in trade a year were now being attracted elsewhere, a large portion of which could readily be retained locally, providing they went after it. Twenty-nine experts in various phases of merchandising participated in the conferences. The total out-of-pocket expense, which was borne entirely by our company, was $2500, or about $3.30 per prospect. It would have been impossible to give each of these prospects the same story individually, but even to attempt it would have cost several times as much.

It is too early yet to appraise this store modernization program adequately, although we can point to better than a score of projects directly traceable to it. Individual follow up is essential, and further conferences are being planned this year to keep the ball rolling. The incidental publicity created by these conferences is, in my opinion, worth the price of admission.

Purpose of Production

If there is one thing we have all learned in three wars, a depression, a couple of booms, and a half-century of lurching but continuous over-all growth, it is that obsolescence is not a disease of the hands or feet of business. It is a mental illness that affects the whole body of business. As such, its elimination is mainly a matter of attitude, of intent, of understanding.

We know that the purpose of production is not just manufacturing, not simply lower unit cost, not even sales at a price. The purpose of production is consumption. Not making, not selling, not buying—but using.

In our business, we should know that best and most. In one way, we are lucky that producing electric power is linked so closely to consuming it. We have load dispatchers to adjust output to demand. Day and night, around the clock and the calendar, we fly the steady patterns, and the whims, of people and of the weather. We know the patterns well, regular size or emergency. We are able to adjust much more quickly than other industries with a long time lag between product design and ultimate use, and the eventual satisfaction that completes the circuit. It's a long circuit, with a lag of years, between the design section of an automobile company and the proud owner of a new car—not to mention the last, hopeful owner of the trade-in. By the time they get the answer to a new model, it's too late for the next question.

But, sometimes I think the immediacy of this end of our business blinds us to the broad forces that continuously affect us as they affect all business. Our future market is conditioned by these forces. The same realities of selling bear impartially on the butcher, the baker, and the candlepower maker. On us.

Competition is Total

For competition, like production, is total. Like General Motors, General Baking, and General Foods, a public utility is constantly engaged in proving its utility to the public. If we are to do more than meet demand, if we are to create demand, it must be in the honest awareness that a kilowatthour is in direct competition with a few slices of bread, three miles of gasoline, 15 minutes of movies, and a short beer.

"The public" is only an anonymous label for our fellow members of the human race who measure their wants in terms of living. People have a definite amount only of time and money. How we spend both is determined by our interests and our motives, our hungers and our satisfactions. These are less definite and more flexible.

Must Build Market First

Let us, therefore, appraise the future market in the knowledge that electric power is not separate from other products, that demand, on the load dispatcher's dials, is not a thing apart from the public desire for electric living. Let us agree that to sell that future market, we must first build it.

We know what we ought to do and how to do it. We know the tools. What we may not know, or accept, is that we must use the same tools that everybody

else uses; that we have the same goals and operate under the same conditions; that our selling methods for the future market must be modernized to take into account what is happening to selling in other industries.

I still believe in doorbells, in the rough ratio of sales to calls. But I also know that television can ring a thousand bells at once—and consume a few kilowatthours while doing it.

The Right Corporate Attitude

I would like to see more salesmanship at the point of sale. But I have come to believe that selling is not a point but a process, a never-ending development of a relationship between buyer and seller that is continuously and mutually rewarding. Selling is what the oldtimers called "the slow pitch," the steady push for tomorrow's business.

Most of all, I think our industry must assume the kind of corporate attitude in which planning for sales has equal footing with the planning for generating capacity we now figure so carefully to fit general economic growth. If we will devote the same thoughtful understanding to sales that we devote to calculating future demand, we will have a margin of merchandising also a little bigger than we think might be needed for maximum operation.

If we devote to selling for the future market the same care for costs we devote to the manufacturing of electric power, we will be able to compete successfully in the total market for that grand prize we all seek—the satisfied customer—the people on the far side of the meters whose educated desires make the hands go 'round—the kind of people whose attitude adds up to, and makes possible, the future.

The Meaning of Light's Diamond Jubilee

(*Continued from page* 188)

trious electrical manufacturers committee. In the great climax of activity that I am anticipating this October, we may forget those who have made it possible, so let's give them their recognition now.

It is unnecessary for me to remind the greater majority of the electric utility companies and manufacturers of what the Jubilee can mean to them. They are already backing their understanding with positive actions. Some have begun their activities, others have completed their plans, and a number are in the midst of their planning stages. These plans and activities show an amazing variety, but they are all geared to the Jubilee's theme of electrical progress.

Varied Undertakings

Out on the Pacific Coast an all-industry participation approach is being used in extensive Jubilee planning. There Electrical Week will be celebrated from October 18 through 24. One spectacular undertaking will be the proposed lighting of a tower of the Golden Gate Bridge with over 2000 colored lamps to simulate a gigantic Christmas tree.

In Arizona a very fine program has already been launched around the "Light for Freedom" theme.

At Dearborn, Mich., Jubilee observances take yet another form. Here the utility company and General Electric are working closely with the Ford Museum in a program of exhibits, which are expected to be seen by a million visitors. The exhibits opened on May 1 and will run through November.

In mentioning the list of anniversaries at the beginning of this talk I might well have mentioned the centennial of Atlantic City, this year's convention site. The city is tying in its centennial with the Diamond Jubilee and on June 1 started an intensive 100-day program. Likewise, Butte, Mont., is tying the Jubilee in with its 75th anniversary. The range of other activities reaches from the televised Orange Bowl salute to the Jubilee on New Year's to the Jubilee exhibit at the Pennsylvania State Farm show.

To give national coherence to these activities on the local level, there is the Jubilee motion picture, "The Eager Minds," which gives in dramatic visual terms the progress of our people and a forecast of our future. Also high on the schedule is the two-hour television show on three networks, which is being produced by David O. Selznick. This will bring the electrical progress story right into the living rooms of millions of homes throughout the land—appropriately enough through one of our industry's modern electronic miracles.

Hustle While You Wait

Thus, in viewing the Jubilee at this time, only five months from the October day that will mark its climax, I think we should be impressed by the energetic way in which the companies are preparing and by the great quantity of favorable publicity already received. All in all they seem to be living up to Edison's own emendation of the old saying, "Everything comes to him who hustles while he waits."

It should be our hope that all this activity will prove to have an uplifting effect, helping to remind people the world over of the progress that a peaceful nation can bring about with the aid of electric power. If our efforts do achieve this result, it could not come at a better time. In many areas of the globe we find a defeatist, Munich-like attitude prevailing. Beset by problems that seem unsolvable, many men are running out of hope. They are in a mood for compromise — even though similar compromises in the past have proved to be little more than complete surrender.

The Ironic Aspect

The bitterly ironic aspect of this situation is that the sinister force of international communism bases its outward appeal on the promise of better things for the masses of the people. It is up to us to keep working to prove that the way to achieve this goal is by the methods that have come into our lives during the 75 years of the electrical industry. It was a marvelous force that Edison released to the uses of mankind. The farther we can extend the benefits of that force, the more chance we have of seeing Light's Centennial celebrated with g e n u i n e fervor throughout a peaceful and prosperous world.

Power System Engineering Faces a New Challenge

E. H. Snyder

General Manager, Electric Department, Public Service Electric and Gas Company, and Chairman, EEI Engineering Division General Committee

An address before the 22nd Annual EEI Convention, Atlantic City, N. J., June 1, 1954

OUR electric utility team of management, finance, sales, operations, and engineering has done a magnificent job during the past two decades. It has brought us through depression, war, and inflation with a record of which we are justly proud. Since 1932, annual energy production has increased from 70,000,000,000 kwhr to 350,000,000,000 kwhr, while the average cost of service to all of our customers has been reduced from 2.85 cents to 1.77 cents per kwhr. In the residential field alone, average cost per kwhr has been reduced from 5.60 cents in 1932 to 2.74 cents at the end of 1953. This is a truly remarkable accomplishment when it is considered that taxes and the cost of materials, equipment, and labor have doubled during the 22-year period.

In the eight years since World War II, the effect of inflation on the cost of constructing and operating the plant has been most severe. The cost of high efficiency steam plant capacity increased from about $115 to $165 per kw, a typical large power transformer from $50,000 to $85,000, a small distribution transformer from $125 to $200, and the ever important residential meter from $8.25 to $13.25. Fuel and operating labor increased about 60 per cent, while taxes continued at nearly the wartime level. In spite of this overwhelming handicap, the industry has held the cost of service to the customer approximately constant at 1.8 cents per kwhr. This was made possible by vastly improved efficiency in all of its operations during the postwar period.

Engineering for the Future

With little prospect of relief from the burden of high costs, the major hope for maintaining earnings from here out lies in engineering for an ever greater measure of economy in plant and operating expenditures. Our present level of economy has been attained by utilizing larger and more efficient units, by loading the plant more heavily, by careful long-range planning, and by meticulous attention to countless details of design and operation.

E. H. SNYDER

But what of the future? Surely we shall continue the practices which have been so effective thus far, but our cost curves have flattened out or turned upward. Yet our forecasters say we must build for a load which will double in ten years, quadruple in 20. Can we combine the experience of the past with the materials of the future so that we may profit as we grow? That is the $64 question. That is the challenge that industry engineers face. The industry may rest assured that they will meet the challenge with intelligence and resourcefulness, and above all else, with enthusiasm.

At this point I should like to point out that our industry is unique in its traditional policy of free interchange of information among its member companies. There is nothing quite like it elsewhere in the business world. This atmosphere of mutual interest and understanding enables all of our committees to function with unusual effectiveness, for the good of the individual company and the industry as a whole.

The Edison Electric Institute has six major engineering committees whose members are drawn from the 170 companies which now comprise the Institute. These committees are actively engaged in applying the collective experience of the industry to the solution of the problems which develop in the construction and operation of individual systems and to the development of standards and practices which promote the interests of all. Their membership represents the best brains and experience in power system engineering, and it is to them that I have turned for the material upon which this paper is based.

I asked the chairmen of these committees to consider the problems of the present in their respective fields and give me their thoughts as to the needs of the future and the trends of development which, in their opinion, could be most profitably pursued. I was deluged with answers, and my greatest difficulty has been to screen the ideas and relate to you only those of major importance. I am a reporter for our engineering committees, and not a prophet.

Steam Generation

In the field of steam generation, tremendous advances have been made during the past decade in several ways. The trend towards higher temperatures and pressures and the use of reheat has resulted in machines operating at throttle conditions of as much as 2350 psi, 1100 degrees, with reheat to 1050 degrees, capable of producing a kilowatthour of electric energy from 9000 Btu of fuel. Boiler and turbine manufacturers, in conjunction with one of the large utilities, are designing a unit to operate at a supercritical pressure of 4500 psi and double reheat, which has a calculated heat rate of 8400 Btu per kwhr.

At least one other combination of manufacturers has well-advanced designs along similar lines. The advance

into the region of temperatures above 1150 degrees awaits the development of commercially practical high-temperature alloys. Numerous other heat-cycle combinations are being actively studied, including the use of gas turbines in combination with the steam cycle, exhausting the gas turbine into the steam-boiler furnace, or utilizing the exhaust to heat the feedwater. An installation of the latter type using natural gas as the fuel is in commercial operation at the present time. Recent progress in chemical treatment of fuel oil to inhibit corrosion has removed one of the serious obstacles to the wider application of the gas turbine.

Rivalry a Healthy Condition

There is much rivalry among manufacturers and utility engineers in producing and utilizing more and more efficient generating units. This is an obviously healthy condition which should continue to set new standards of economy in power production. It should not be forgotten, however, that equally important with the establishing of new records by individual units is the lowering of the average heat rate of the system by replacing older and less efficient units. The 1953 average heat rate of all systems was 12,950 Btu per kwhr as compared with the best unit rate of about 9000 Btu. The rate at which replacements can be justified depends upon economic considerations which are governed largely by load factor and rate of growth in the particular system.

Short-Duration Peak Loads

The most economical way of supplying short-duration peak loads still is by use of the older, relatively inefficient equipment rather than by the installation of new machines. This is the time-tested practice throughout the industry. However, one company is constructing a new low-cost station designed specifically for an average operation of only 4000 hours annually. Other companies have installed gas turbines at system fringe locations for peak-load operation and transmission back-up. These applications are being watched with much interest.

The trend towards larger and larger units continues, there being on order machines as large as 250,000 kw on a single shaft, and cross-compound units of slightly higher rating. With the advent of direct contact hydrogen cooling or liquid cooling of generator windings, the manufacturers appear confident that they can produce machines of as much as 300,000 to 500,000 kw of capacity in the future. Whereas utility engineers in the past have spurred the manufacturers towards higher and higher ratings, rather suddenly it appears that the manufacturers may offer sizes which we are not ready to take. What the limit in capacity may be, no one can predict, but it may well be that there are adverse considerations which, at some point, will offset the gains of size factor and dictate that there are no further advantages in size alone.

In the case of boilers, there is some indication that units above 200,000 kw should be designed with two or more separate furnaces, in order to maintain a reasonable surface-to-volume ratio and to keep within structural design limitations. This simply means that the over-all cost of the boiler per unit of output may be higher than it would be in a smaller, single-furnace unit, and we have lost part of the important saving which accrues from the large sized unit boiler-turbine combination.

Centralized Plant Control

Centralized control to improve plant operation and reduce the number of attendants has been almost universally adopted. Under the pressure of economic necessity the practice of placing more and more equipment out-of-doors to reduce building volume and cost is being extended from the South into the colder sections of the country. The use of prefabricated panels of many types in place of masonry walls to save construction cost is gaining in favor.

Along with the increase in size of generating units, there has come a change in our thinking as to what maximum capacity we should install in an individual steam station. How many eggs are we willing to put in one basket? When one considers doubling or quadrupling the load on a given system, the conclusion is immediately apparent that we must plan for steam generating stations of 1,000,000 or even 2,000,000 kw of capacity within the not too distant future. Some of the older metropolitan stations already have approached the 1,000,000-kw mark, and there are, of course, new stations of more than this capacity under construction in connection with the supply of power to the Atomic Energy Commission in the Middle West.

Our plant engineers are much concerned about the scarcity of suitable sites for new plants in the vicinity of the larger cities, and the problem of stack emission, which is currently being given so much publicity, has ruled out many suburban sites which in years past might have been considered suitable. We may be forced to more remote locations requiring heavy transmission to the load. One utility company is acquiring plant sites for use as much as 15 years hence.

Pre-delivery Coal Processing

With constantly rising transportation costs, the quality of coal delivered on the East Coast and to other sections far from the mines has become of increasing importance. It is possible that the processing of coal to reduce ash and sulphur before delivery may become economically justified. Belt conveyors and pipe lines for delivery of coal over long distances are currently receiving serious consideration.

No discussion of the future of power generation would be complete without some mention of atomic fission. However, since this subject will be treated in the next issue of the BULLETIN, I shall point out merely that your engineering committees are keeping themselves well acquainted with developments in the field. This new source of power is being given careful consideration in their work on system development.

Hydro Generation

In the field of hydro generation, the improvement in efficiency of modern turbines suggests the possibility of justifying the rehabilitation of some of the hydro plants built in the early years of this century. Moreover, it is possible that a restudy of some of the marginal pumped storage projects in the light of present conditions might show that they are economically feasible.

In the field of bulk power transmission, the need for higher voltages is being felt, not only in the systems where long distances are involved, but also in the heavily loaded urban systems where transmission distances are not great. The construction of a large 330-kv system, comprising several hundred miles of tower lines in the Middle West, is well under way, and a number of other lines of 330 - 350 kv

are being planned elsewhere in this country.

It is interesting to note, however, that some of the metropolitan systems having backbone transmission facilities of 110 to 138 kv now find these systems inadequate. To meet the predicted growth, studies indicate that lines of 220 kv to 345 kv must be superimposed on the present system.

In many parts of the country lines of 110 to 138 kv are being tapped directly to feed distribution substations. Thus, what formerly were considered bulk power transmission lines have now become inadequate for this purpose and are being downgraded to the status of ordinary transmission feeders. Lines of higher voltage are taking their place for the transmission of large blocks of power from generating source to switching centers.

Underground Cable Capacity

As would be expected, industrial and residential decentralization programs in suburban areas have made the acquisition of rights-of-way and the construction of tower lines more and more difficult, with the result that larger amounts of underground high voltage lines are being installed. One of the immediate problems in the use of underground cable of 110 to 138 kv is that it is unlikely that a single cable of this voltage, regardless of the size of copper used, can carry the full output of one of the new 250,000-kw generators. While it is not customary to connect a machine of this size into a system over one circuit, the limitation in cable capacity simply means that when one of a pair is out of service, the output of the machine is limited to the capacity of the remaining circuit. Hence we may see some relatively short runs of cable operating at 220 kv or more in the future.

Higher Subtransmission Voltages

In the areas of subtransmission and primary and secondary distribution, the major problems are similar to those in generation and bulk transmission. The prime question is how to economically increase circuit loading to meet the tremendous growth of the future and the obvious move has been to consider higher voltages in each segment of the plant. Subtransmission voltage has been raised to 69 or even 138 kv in some instances in place of the former 33-kv band. A number of companies have adopted 12 kv as their primary distribution voltage. One company has several hundred miles of 23-kv primary circuits in operation. Others are considering this voltage level for the future.

The higher voltage introduces many problems. Basically it means that about 6000 kw of load will be affected by a circuit outage instead of 2000 kw at 4 kv. It means the acceptance of live line maintenance either by use of special tools or working platforms, or else the interruption of circuits whenever line work is to be done. The difficulty of running lines through trees is considerably increased.

Companies which have adopted the higher primary voltages are generally satisfied that the advantage of higher capacity greatly outweighs the operating difficulties. It appears that this practice will gain in acceptance. The usual changeover method is to restrict the original 2.4 or 4-kv primary system to the older urban areas and build the higher voltage system in the surrounding suburban and rural territories.

The tremendous increase in use of large appliances, such as air conditioners, ranges, deep freeze units, space heaters, and hot water heaters in residences, has produced a formidable problem for our distribution engineers. In some sections of the country there are many homes having coincident demands of as much as 20 kw each, which makes it impractical to serve a group of them from a common 120 - 240-v secondary.

Higher Secondary Voltage

Consideration is being given to the use of higher secondary voltage as the solution to this problem. At the same time, there are numerous office and industrial buildings recently connected wherein the size and nature of the electric load warranted the adoption of a higher secondary voltage. For example, in one new building having a demand of 10,000 kva, it was found that the owner could save more than $400,000 in wiring by using a secondary system of 265/460 v instead of the usual 4-wire 120/208-v system. Moreover, it was found that the company serving this building could also save a considerable sum by going to the higher voltage. The two problems are closely interrelated because the question of increasing the standard lamp and appliance voltage from 120 to 240 or 265 v ultimately must be answered in each case.

The subject of higher secondary voltage was considered to be of such importance that a special subcommittee of the Transmission and Distribution Committee has been formed, with representatives from the Electrical Equipment, Meter and Service, Accident Prevention and Rate Research Committees, and the Commercial Section to make a comprehensive study to determine what standards should be established for the future. This is a most complex problem, requiring for its solution an extensive engineering study, which must include considerations of safety and insurance codes, and municipal regulations as well as rate and sales aspects.

Need for Adequate Wiring

When we view the possibilities of future load growth on the electrical system, it is of basic importance that we consider particularly the needs of the domestic customer, for it is he who will originate much of the demand for increased service. A concerted effort is being made to educate home builders and electrical contractors in the need for adequate wiring for new high levels of domestic load. This means the installation of 20-amp, 3-wire branch circuits with 120 and 240-v appliance outlets and a number of heavy duty circuits in new homes. Active steps also are being taken to encourage customers to reinforce wiring in older homes to handle added appliance loads.

The industry has the tools as far as meter and service equipment is concerned to stay well ahead of any foreseeable load growth. A suggested minimum for new installations would be a 100-amp, 3-wire service entrance with one of the recently developed extended range meters capable of accurately registering loads from 10 w to 24 kw. The development of two self-contained meters to handle a load range formerly requiring six different ratings is a notable result of the co-ordinated work of our meter engineers and meter manufacturers.

High Standard of Service Guarded

In their efforts to build more economically for heavier loads on every element of the power system, our engineers have jealously guarded the industry's high standard of service. This has been an all-important factor in promoting the use of electricity. Each new application of electric service has brought with it added responsibility

for reliability of supply and close limits of voltage regulation. The maintenance of this standard has led to extensive use of automatic network systems, rapid reclosing on transmission and distribution circuits, pole top regulators, capacitors, more effective lightning protection, and improved line construction including more tree wire and aerial cable to better withstand falling tree limbs during wind and heavy ice storms.

Much forethought has been given to the development of tools, methods, and procedures for rapid restoration of service when storm or disaster strikes. Radio-equipped cars and trucks and walkie-talkies have proved invaluable in speeding repair work. Many companies have carefully worked out master plans for the mobilization of their forces in areas where storm damage is too severe for local crews to handle. Again our industry is unique, for these plans go beyond company boundaries in providing for assistance from neighboring or remote companies whenever needed. In our endeavor to serve our customers, we are truly all for one and one for all.

Industry Needs Anticipated

To the manufacturers must be given much credit for the development of more reliable and more efficient generators, transformers, circuit breakers, and apparatus of all kinds. Working in close co-operation with industry engineers, they have done an outstanding job of anticipating and fulfilling our needs in the past. We can be sure that their vast research and development facilities, functioning competitively, will produce the new and better equipment which we must have for the future.

The Institute and its member companies are actively fostering research in diverse fields, including atomic power generation, the behavior of metals at high temperature, fittings for aluminum conductors, and strength of wood fibre. Our research program will continue at an accelerated pace. Sound long-range planning in a high capital investment industry such as ours is vitally important. The system planning and development functions of our committees have recently been strengthened by an organizational change to coordinate the interests of the Prime Movers, Electrical Equipment, and Transmission and Distribution Committees. We look for broadened activity and increased effectiveness in this phase of engineering committee work.

In this paper I have endeavored to define the task which lies ahead for power system engineering, and to sketch some of the current practices and recent developments which hold promise for the future. Ours is a dynamic industry with a boundless capacity for growth. We cannot grow by merely doing more of the same. We must continually re-examine our practices, for in the struggle to control costs, what we did yesterday will not suffice tomorrow. We must work our present materials harder and seek new ones that are stronger. We need new ingenuity and new boldness in engineering. We need young engineers fresh out of college. They will find a full measure of glamour in super voltages, electronic relays, and pipes that glow red with the heat of steam. But, more important, they will find the challenge of an infinite variety of problems. They will join a crew of top-notch engineers who are old in experience, but young at heart, because they know the pride and joy of accomplishment. Together they look eagerly to the challenge of the flight ahead. For the electric utility industry there can be only one forecast—High Winds but Ceiling Unlimited!

Street Tree and Utility Conference to be Held in Cleveland Next March

FINAL arrangements and program details are now going forward for the "Street Tree and Utility Conference," to be held March 3-5, 1955, in Cleveland.

The conference will be held under the joint sponsorship of the following three organizations:

The Transmission and Distribution Committee
EDISON ELECTRIC INSTITUTE
John W. Anderson, Chairman (Philadelphia Electric Co., Philadelphia, Pa.)

The Shade Tree Selection Committee
NATIONAL SHADE TREE CONFERENCE
Edward H. Scanlon, Chairman (Commissioner of Shade Trees, Cleveland, Ohio)

The Street Lighting Committee
ILLUMINATING ENGINEERING SOCIETY
Kirk M. Reid, Chairman (General Electric Co., Nela Park, Cleveland, Ohio)

The purpose of the conference is to study the need for a long-range program designed to evolve a plan whereby trees and utility installations may harmoniously occupy streets and highways. Consideration of contemporary clearance problems will not be germane.

The conference has been enthusiastically endorsed by many of the outstanding city arborists of the country, including Fred R. Thomason, Chicago; Walter I. Meyers, Detroit; Joseph A. Dietrich, Greenwich; M. W. French, Richmond; Carl Fenner, Lansing; John W. Batson, Washington; Greggs Waring, Milwaukee; Joseph A. Sweeney, Toledo; Harry T. Turner, East Orange; Frank E. Karpick, Buffalo; John C. Kenealy, Ardmore, Pa.; Herbert J. Cran, Jr., New Haven; Fred W. Roewekamp, Los Angeles; and Edward Connell, Stamford.

Invitations to be Extended

Invitations will be extended to all persons and groups interested in the problem, including communication companies, state and municipal foresters, roadside engineers, arborists, professional tree-trimming organizations, and nurserymen. The program will be built upon discussions conducted by representatives of various groups, and several nationally known speakers have already indicated their willingness to participate.

Conference papers and summary recommendations will be published in the proceedings of the meeting and will be available to anyone interested in obtaining a copy.

It is the opinion of all persons contacted so far that the conference should prove to be a vehicle whereby a spirit of co-operation can be created, with the result that greater beauty and better electrical service will emerge from the proper use of streets and roadsides.

Facing Up to the Cost Problem

Stuart Campbell
Partner, Booz, Allen & Hamilton

An address before the 22nd Annual EEI Convention, Atlantic City, N. J., June 2, 1954

YOUR industry has done a tremendous job of anticipating the country's power requirements. You have developed and constructed much more efficient generating stations. And you are doing an excellent job of investigating what may become much more effective means of producing power. For many years the adoption of such far-reaching technological improvements, along with a very substantial increase in the volume of your output, permitted you to maintain rates while still producing a satisfactory return to your security holders.

But in recent years rising costs have made rate increases necessary. Your capital investment is mounting rapidly to meet the needs of your customers. The higher plant costs, higher labor rates, and other rising elements of operating costs have tended to minimize the favorable factors of bigger volume and technical advancement. As a result, the industry faces, in many instances, lower profit margins.

Great Growth Potential

While this change in profit margins warrants management attention, you are entitled to undertake a study of it in an atmosphere of optimism for the future. The approaching general population increase, including a shift in age groups within the population that means there will shortly be a considerable increase in the number of families to be served, adds up to a continuing greater demand for electric service. New products, such as air conditioning and electric home heating, add further to the promise for the industry. Despite the present leveling off, your industry forecasts for the next ten years are still sound indicators that you have great growth potential.

There is every possibility that you will not only have to build the substantial further capacity indicated by these forecasts, but that the added volume may be realized at an even

STUART CAMPBELL

greater rate than that which you have enjoyed in the past ten years. This probable high rate of expansion will bring with it some important changes in management requirements. One of the most important of these is that there will be a different problem of cost control.

Industry generally has found that rapid expansion brings with it a change in the control methods required. This will be true of your industry. More people will be involved. The lines of communication will be longer. Not so many problems can come up to the top personnel—they must be dealt with down the line. Policies can be set at the top, but they will be interpreted by a larger group that is often widely separated, both organization-wise and physically. You will run into more of the old home office-branch problems. Your organization requirements will change.

As your companies grow and as you make changes in your plans of organization, you will necessarily make changes in methods in order to insure that the added volume, with its higher capital investment, is still handled with the right profit result. This has often been industry's problem—to keep proper control over a rapidly enlarging business. Thus, the ingenuity you have shown in the recent growth period will again be called on to meet some old problems that will have new aspects.

For those reasons, I should like to direct your attention to the differences in the problem of maintaining proper balance and control that you will face as you approach further rapid expansion. You will reappraise the need for decentralization. As volume grows, you will find it advisable to pass decision-making responsibility more and more to the division and district organizations. You will control more by report and less by personal administration.

Specific planning will be needed to insure that you do not increase the administrative group unduly, as there is always a tendency for each function and each level of supervision to grow with the added business as each department head sizes up the increased business in relation to his particular part in it. In one company which estimated that its revenue would multiply three times in the next ten years, nearly every supervisor came up with a plan requiring two and one-half to three times as many people in his area. Obviously, this is a wrong conclusion.

Cost Consciousness At All Levels

Again, in a larger organization it becomes of great moment that cost consciousness be maintained at more than the top echelon. It must be present at all levels if the right end result is to be obtained, but we often note that where it is a vital factor in a moderate-sized group it gets lost as more and more people are involved.

How do you get cost consciousness? You get it by letting people take a hand in the development of plans for doing things, by making sure that people throughout the organization are expected to and do take a hand in evaluating perform-

ance, and by letting them know what the results are. It is one manifestation of teamwork. Partly you work at it—partly you organize for it.

A review of your larger organization plan will need to include a look at your provision for cost information—what is it, who gets it, when do they get it. Budgets, departmental expense statements, and standard cost data will become more necessary. And as you require cost control to become a responsibility of more operating people, you will want to review the form and terminology used in your reports in the light of their use by operating rather than accounting personnel. It is important that the information supplied to your supervisors deals specifically with their areas and that it does not include general costs which they cannot identify. Don't ask your district and division managers to become accountants. See if they need to have accounting help located alongside them, and see if you can improve the timing and the form of presentation of operating information so that it becomes more useful in the management job.

Changing Cost Factors

As you expand and change the physical operations, the cost factors that deserve attention will change as well. With an increased number of line crews it becomes more important to study their base locations to avoid excessive travel. You may consider it advisable to increase the number of stores locations or operating headquarters, but first make sure you have taken full advantage of improved communications methods and better transportation. Remember that added stores locations may improve service but will definitely add to your inventory investment. Larger fleets of vehicles may make it advisable to further study fleet costs and possibly to change your automobile and truck purchase and maintenance policies.

Technological improvements, such as those in your most modern generating stations, substantially reduce personnel requirements. A station that used to require 250 men now calls for 70 or 80. Thus, you will need to review your personnel utilization to reach for more flexibility in work assignments. The need to rotate people will make it necessary to look at your wage and salary policies and particularly at your job-evaluation situation. Do differences in division pay policies make it difficult to move men from one location to another? These are a few of the ways in which a change in the physical operation affects your analysis of the cost problem.

Problem of Supervision

Another specific area to be considered is the problem of supervision. Growing organizations need better supervision. There will be a need to delegate authority and responsibility down the line and make management effective at the customer level or at the point of revenue creation. Otherwise, supervision becomes ineffective and higher costs result. Obtaining the answers you want in this area means more effective training. And the need for improvement in supervision goes right up to the top. There will be a definite need for development of executive personnel.

All these things require more attention to the personnel area, more effective use of the personnel department, improved analysis of your potential executive talent, and more rotation of people in various kinds of jobs.

Your past experience will have demonstrated that growth does not mean an across-the-board increase in men and equipment. The operating budgets have to be built upon a consideration of what growth means to each area. As I indicated earlier, administration should not increase proportionately. Each level of supervision and each functional area needs to be reappraised at various stages of growth. It is probable that this year is a logical time for such a move. This means that the top planning function, where all of these various elements are finally pulled together, becomes more and more important. And certainly this is a time to make sure that this over-all forward planning is specifically provided for in the organization plan.

Now there is another problem in your business that is not particularly a result of expansion, but stems from the fact that you are in a service business. As an industry you have set high standards of service. This is fundamental to your success, but it raises a specific problem of control that I believe you need to think about. As you spell out your service standards and make sure that throughout the company you continue to render good service, you may dissipate the control of costs or may have to adopt new approaches to make sure that costs as well as service are considered when you establish service standards.

This emphasis on service affects your internal as well as your external relationships. You get used to talking about taking good care of the customer, but service tends to become the all-important aspect of the transaction. Your service standards need to be reviewed regularly to see that they are set with due regard to cost and that they are sensibly expressed for the guidance of people who are removed from the continued and regular impact of the costs involved.

Suggested Procedure

As you review the implications of these remarks against your particular situation, you might want to have in mind a few points that serve to identify the need for action. Here are some suggestions:

1. Review your forecasts of growth over the next ten years to see the extent of the probable effect on your management planning, and the timing of it.
2. In the light of that forecast, take a new look at your plan of organization. Can it be readily expanded to handle the added volume of business or will it require some basic changes? Do you need to create a different divisional set-up? Is your home-office group too inclined to reach into the district manager's job? Are the top people overloaded?
3. As you visualize changes in the organization structure, will they make it more difficult to determine where the responsibility for costs lies? Will the responsibility remain too high up in the company?
4. As you develop organization changes and visualize the broader responsibilities of many positions, will you be able to

(*Continued on page* 235)

Looking Ahead to the Last Quarter of the First Century of Electric Power in the United States

Walker L. Cisler
President, The Detroit Edison Company and
Chairman, EEI Electric Power Survey Committee

An address before the 22nd Annual EEI Convention, Atlantic City, N. J., June 2, 1954

AS we observe Light's Diamond Jubilee and reflect upon the far-reaching achievements of the electric light and power industry during the past 75 years, it is fitting that we should continue looking ahead—to envision the probable power requirements of the future and to measure the task that lies before the industry in fulfilling its responsibility.

Seventy-two years ago, in September of 1882, Thomas Alva Edison placed in operation the first thermal-electric central station — the Pearl Street Station in New York City—which had a capacity of 900 kw and reportedly served 59 customers its first day. That plant operated with a load factor of less than 10 per cent and consumed approximately 10 lb of coal for each kilowatthour of electricity generated.

Later that same September, the first hydroelectric station—the Vulcan Street Station—made its debut at Appleton, Wis. These were the beginnings of electric power generation in the United States.

Vast Interconnected Systems

Today, spread across our country, we have interconnected power systems that serve more than 50,000,000 customers. These interconnected systems include more than 150,000 miles of transmission lines operating from 66,000 to 330,000 v. The lower voltage transmission and distribution circuits are many times that length.

Before the end of 1954 these systems will receive power from central generating stations having a total capability of well over 100,000,000 kw, which is more than 40 per cent of all the electric power in the world. The newest of our thermal power plants use less than three-quarters of a pound of coal per kilowatthour, a 13-fold improvement over the first central thermal plants.

WALKER L. CISLER

This growth and development of electric power has been of fascinating proportions — far greater than was contemplated in the early days, when salesmen were employed to go from door to door to convince people that electric lights were superior to gas lights and that electric motors were more effective than steam engines. Our concern in recent years has been in keeping abreast of the rapidly increasing need for power by our industries, our commercial establishments, our homes, and our farms.

In 1947 the Edison Electric Institute organized its Electric Power Survey Committee, instructing it to review periodically the power situation in this country and to advise the Institute of its findings. The report of the Fifteenth Semi-Annual Electric Power Survey, conducted by the committee, has just been published. Most of you probably are familiar with these reports. They have been most informative and useful, especially during the rapid expansion and troublesome period of the Korean struggle. They have established bench marks for reference, and have been used as a guide by other friendly nations in determining their own respective situations.

A Long-Range Forecast

The regular power surveys conducted by the committee have covered only the four years immediately ahead. Thus, the Fifteenth Semi-Annual Power Survey made in early April gives considerable detail regarding actual statistics for the past few years and presents the current forecasts for the years 1954 through 1957. This has been adequate for the purpose because it is possible to design and construct generating stations and other facilities within a four-year period. It is true, however, that much long-range planning had to be done to make these short-range accomplishments possible.

With the intention of bringing the long-range aspects of the power situation into focus, and to provide the basic information for this "Look Ahead," the Power Survey Committee has recently completed a forecast of the peak-load power requirements to 1975. The methods and sources of information used were similar to those employed in the regular surveys with the exception that the maximum and minimum limits of peak load were given rather than specific peak-load forecasts.

For the purpose of this discussion, we have assumed that the last quarter of the first century of the power industry in the United States is from 1950 through 1975.

Fig. 1 depicts the peak loads that have occurred since 1920 as shown by EEI statistics. In the earlier years of this period load growth was comparatively small, but since the mid-Thirties the increase has been rapid. The 1953 peak load—81,600,000 kw—

is more than double that of 1945. These data pertain to the entire electric power industry engaged in supplying power for public use rather than to the approximately 97 per cent of the industry represented in the regular power surveys.

Peak Loads for Future Years

The peak loads which are expected for future years, shown by Fig. 2, at first seem somewhat startling. For 1965 the Electric Power Survey Committee estimates that the peak will be between 157,000,000 and 190,000,000 kw. This means that the peak load of 1953 will be approximately doubled in 12 years, something which has been predicted many times by those familiar with the power industry.

For 1975 it is estimated that the peak load will be at least 262,000,000 kw, and possibly as high as 367,000,000 kw. Although these may seem large indeed, the estimated minimum peak-load growth from 1955 to 1975, shown by Fig. 2, is at the rate of only 5.4 per cent, compounded annually, while the maximum peak-load growth is at the rate of 6.8 per cent. These values may be compared with the 7.8 per cent annual growth for the past 15 years.

Of course we do not know precisely what new loads and increases in existing loads will occur to bring about this large advance in power requirements. But in 1942, when we first began atomic energy development as a military project, no one could have forecast that atomic energy would now be one of our largest power consumers. Other similar power consuming developments are likely to occur in the years ahead. We can foresee tremendous advances requiring very large amounts of power in the steel and metal industries, the chemical industry, in space heating, and other uses which, when combined with our expected population growth and improved living standards, can easily bring about the peak loads indicated.

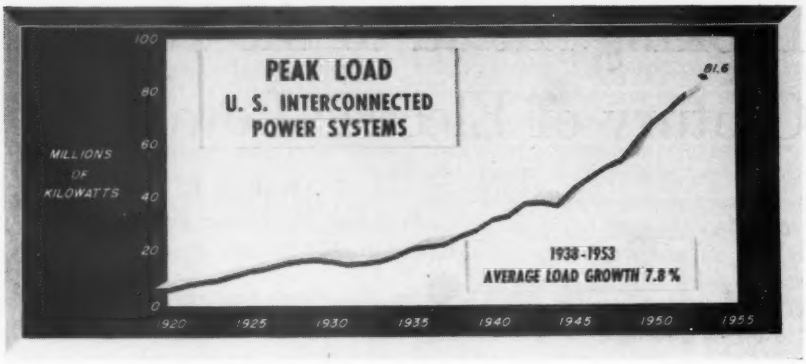


Figure 1

These forecasts have been prepared by men in the industry whose daily responsibility is that of looking ahead for their individual power systems. They have used their experience of the past and their best judgment concerning the future. We can consider, therefore, that the peak-load forecasts shown by Fig. 2 point out the responsibilities which the power industry must assume, and provide the best foundations available to us for looking ahead to the next 25 years.

National Considerations

Our first thought in looking ahead is to be prepared to meet the power needs of our country as we have in the past. We are all aware of the importance of electricity to our national economy and fully realize the significance of what a lack of power would mean. The maintaining of our high standard of living requires that power be available at costs which permit its practically unrestricted use.

We have been fortunate here in the United States because we have had an adequate supply of power at relatively low cost. We have been able to utilize literally thousands of power consuming methods and devices. Obviously, power has not been the only factor in the advance of our economy, but it certainly has been one of the key factors.

Should we look elsewhere in the world and examine the circumstances closely, we will find that in those areas where low-cost power is available living standards are comparatively high. Undeveloped areas generally have inadequate power. Also, in those areas where periodic shortages of power occur, regardless of power costs, the economic maladjustments are particularly hurtful.

The strength which an adequate supply of power gives our industrial system and national economy is of greatest importance during times of national emergency, as clearly demonstrated during World War II and the Korean conflict. The margins of generating capacity which the power systems had built up prior to both of those periods were adequate to permit the prompt and steady expansion of our military production and, thus, to establish and maintain the required defense effort. Naturally, it was necessary to build additional generating capacity to meet defense and other power requirements in many areas, but the capacity available when hostilities began did meet the needs of the interim period.

Julius A. Krug, Director of the Office of War Utilities and later Chairman of the War Production Board, rightly stated, "Power was never too little or too late" during World War II. There were limiting

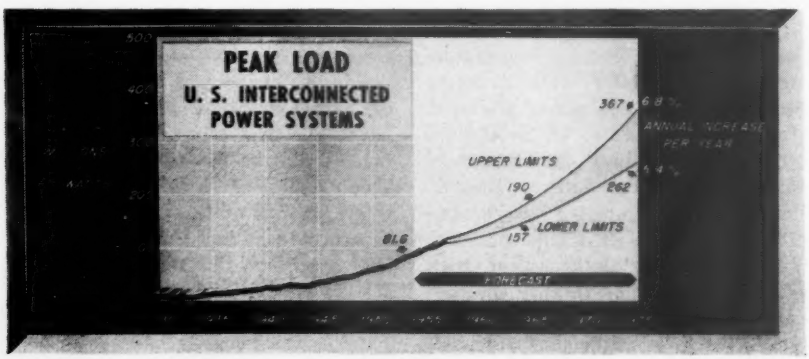


Figure 2

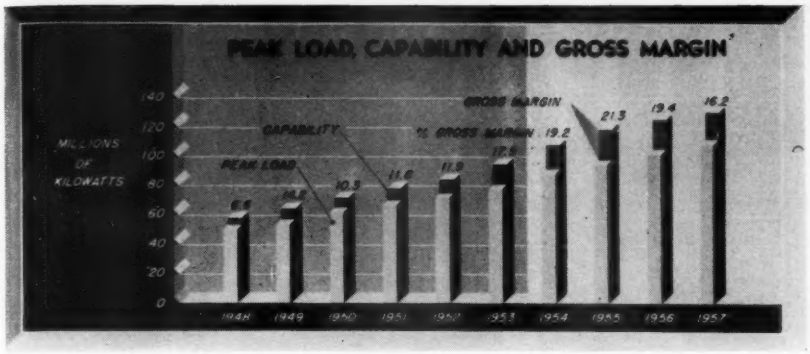


Figure 3

factors in our defense effort but not in power supply. The power situation during the Korean period was equally satisfactory except in comparatively small areas during one short period when hydraulic conditions were far below normal.

Our country's industrial strength, our national economy, our standard of living, and our national security have been achieved, in large measure, through the ability of the electric power industry to meet power needs adequately and economically. Our future depends heavily upon a continuing adequate supply of power. The electric power industry, in looking to the future, must plan and proceed courageously to fulfill its responsibility.

Engineering Considerations

Our next consideration in looking ahead has to do with the engineering matters involved. The electric power industry must continue to expand its physical facilities so they will be ample to serve expanding power requirements. Our first thought, quite naturally, concerns generating capacity, but there are a host of other items including fuel handling, transmission lines, substations, distribution, and other facilities.

It has been recognized from the beginning of the industry that power systems must have not only enough generating capacity to carry the peak loads, but also a margin of capacity to provide for: (1) scheduled and unscheduled equipment outages; (2) leeway to permit system control; and (3) unforeseen loads. In the power survey reports this difference between the maximum capability of the interconnected systems and the peak load has been termed "gross margin."

The conditions which have existed since 1948 and are forecast for the years 1954 through 1957, as revealed by the power survey reports, are shown by Fig. 3. In the last six years, the gross margin has varied from a minimum of 6.6 per cent in 1948 to 17.5 per cent in 1953.

The matter of gross margin has been studied at length by the Electric Power Survey Committee, the Federal Power Commission, and other governmental organizations, during World War II and the Korean conflict. There is no formula by which the optimum gross margin for any one or for all power systems can be determined. Some systems can operate with a gross margin as low as 5 per cent or less, but others require much more. The studies of the Electric Power Survey Committee indicate that if the gross margin for the country as a whole falls below 10 per cent, moderate curtailment is likely to occur in certain areas of the country. Fifteen per cent gross margin for the country as a whole appears to represent desirable conditions and with this margin there is little likelihood that curtailment will occur except perhaps in the event of adverse hydro conditions in areas largely dependent on hydro generation.

Applying this value of 15 per cent to the peak-load forecasts, the required capability can be estimated (Fig. 4). Now that you have perhaps recovered from the shock of peak loads predicted, these capability values may not be too surprising. But certainly the possibility of the need for a country-wide generating capability of at least 181,000,000 kw and perhaps as much as 218,000,000 kw by 1965 gives reason for serious thought.

The Present Expansion Program

The present expansion program will bring the capability up to 127,000,000 kw in 1957. By 1965 it will have to be raised an additional 50,000,000 to 90,000,000 kw.

It may be difficult for even the most optimistic to comprehend the indicated need for a minimum of 301,000,000 kw or a maximum of 423,000,000 kw by 1975.

If we analyze this projected expansion requirement further, however, and compare it with the industry's accomplishments since 1950, the problems become somewhat commonplace. Following the outbreak of the Korean conflict, there was a need for greatly increased amounts of power and the electric power systems undertook a vast expansion program. What has been accomplished can best be illustrated by Table I, which shows the new generating capacity that has been installed in the years 1950 through 1953. Table II shows the new capacity now scheduled for completion in 1954 and later.

The years 1950 through 1953 were difficult indeed because of material shortages. Yet in those four years

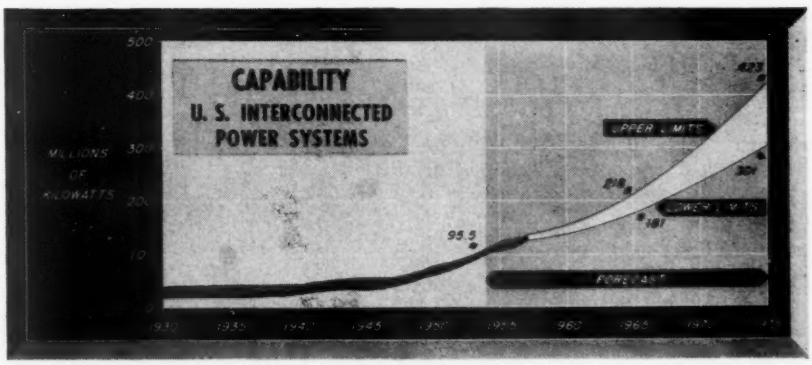


Figure 4

the power systems actually brought into service 473 thermal generating units and 159 hydraulic units with a combined capability of more than 29,000,000 kw. The best year was 1953, when 119 thermal units with a capacity of 8,700,000 kw and 54 hydro units with a capacity of 1,500,000 kw were brought into service.

TABLE I—GENERATING CAPACITY ADDITIONS—1950-1953

	Thermal Capacity (Millions of Kilowatts)	Hydro Capacity (Millions of Kilowatts)	Total Capacity (Millions of Kilowatts)
1950	4.8	1.0	5.8
1951	5.7	1.2	6.9
1952	4.9	1.6	6.5
1953	8.7	1.5	10.2
Total	24.1	5.3	29.4

The expansion program for the years 1954 and 1955, shown by Table II, is also impressive—191 generating units with a capability of 13,900,000 kw scheduled for service in 1954, and 132 units with a capability of 11,600,000 kw in 1955. There is little doubt that these programs can be carried out substantially as now planned.

TABLE II—SCHEDULED PROGRAM —1954 AND LATER

	Thermal Capacity (Millions of Kilowatts)	Hydro Capacity (Millions of Kilowatts)	Total Capacity (Millions of Kilowatts)
1954	12.6	1.3	13.9
1955	10.0	1.6	11.6
1956	5.5	0.7	6.2
1957	2.0	0.4	2.4
Total	30.1	4.0	34.1

Table III gives the estimated new capacity requirements by five-year periods. Up to 1965, the capacity additions should average somewhere between 7,000,000 and 12,000,000 kw a year. This should not be an overly difficult problem in view of 1953 accomplishments and the 1954 schedule for new capacity. The estimates for the years 1965-1975 indicate high annual capacity additions, averaging from about 11,000,000 to nearly 24,000,000 kw. With adequate advance planning it should be possible to carry out such programs.

In carrying out power-plant expansion programs of the size in prospect, there is the possibility that capacity additions may fall below the average

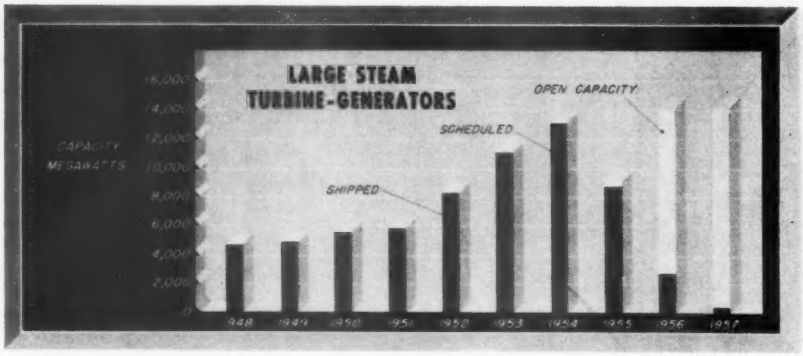


Figure 5

requirements for two or three years and thus necessitate above-average additions in other years. While our heavy power equipment manufacturers have a very large capacity for the production of power plant equipment, this capacity can be fully effective only when orders for equipment are placed far enough in advance to permit uninterrupted manufacturing operations.

TABLE III—ESTIMATED REQUIRED CAPACITY ADDITIONS—MILLIONS OF KILOWATTS

5-Year Period	Required Capability Addition Minimum	Required Capability Addition Maximum	Average Yearly Addition Minimum	Average Yearly Addition Maximum
1955-1960	33.1	43.5	6.6	8.7
1960-1965	42.0	61.2	8.4	12.2
1965-1970	53.0	84.9	10.6	17.0
1970-1975	67.0	119.5	13.4	23.9

The production of large steam turbine-generators, shown by Fig. 5, was nearly 11,000,000 kw in 1953 and should exceed 12,000,000 kw in 1954. With orders placed sufficiently in advance, the production could be as much as 14,000,000 kw. Similarly, for steam generators, as shown by Fig. 6, the full manufacturing capacity is now estimated as 145,000,000 lb of steam per hour. The actual production in 1952 and 1953 averaged about 115,000,000 lb of steam per hour annually.

While the steam-generator manufacturers will continue to produce at a high rate during 1954, their current orders for units to be shipped after 1954 occupy only a small part of their present productive capacity. They are now beginning to reduce personnel and this reduction will become even more extensive later this year. If this process continues, it will take a long time to restore steam-generator manufacturing operations to the level needed to handle the power industry's requirements. This can create the same tense situation which occurred in 1950-52. The situation in the turbine-generator manufacturing shops is also pressing.

It is almost certain that thermal generating units will constitute upwards of 90 per cent of the generating capacity to be installed in the next quarter century. This is because practically all the economic hydro sites have been developed in areas reason-

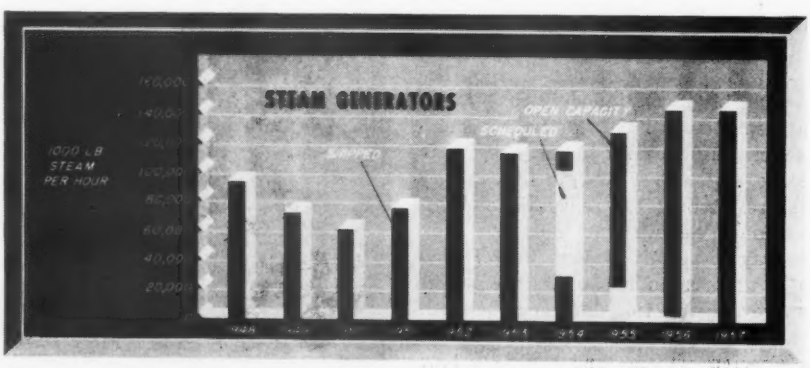


Figure 6

ably close to the heavy population centers, particularly in the eastern part of the country.

This is illustrated in part by the fact that in the last four years hydro units have accounted for 18 per cent of the new generating capacity, as shown by Table IV. As of January 1, 1954, the 114 hydro units definitely scheduled for installation, with a capacity of 4,000,000 kw, amounted to 11.7 per cent of the total new capacity then scheduled for operation prior to the end of 1957.

TABLE IV—HYDRO—PER CENT OF TOTAL CAPACITY

	Thermal (Million Kilowatts)	Hydro (Million Kilowatts)	Total (Million Kilowatts)	Hydro (Per Cent of Total)
Installed, 1950-53	24.1	5.3	29.4	18.0
Scheduled, 1954-57	30.1	4.0	34.1	11.7

EEI statistics, which have been used in Fig. 7, show that since 1945 the hydroelectric portion of the total generating capacity of the interconnected power systems has gradually decreased. This trend will continue in the years ahead.

Atomic Energy

There is, of course, much conjecture concerning the role atomic energy will have in our power supply within the next 25 years. Based upon the technical and engineering information available now, it is almost certain that several large atomic-power reactors will be built within the next ten years, and it will not be surprising if their total capacity is 1,000,000 or even 2,000,000 kw or more. This, however, will be only a very small part of the 180,000,000 to 220,000,000 kw of capacity which is foreseen as required to meet the power needs in 1965.

These reactors will incorporate a great many new and complicated features, and at best their economic justification probably will be marginal. It seems likely, therefore, that considerable time will elapse after these first reactors are built to permit testing and evaluation and further development before atomic reactors will be widely accepted for power use. A considerable number of additional atomic-power plants should come into service in the years 1965-1975, but it is not possible at this time to make any forecast concerning the total capacity which may be involved.

If it is assumed, for example, that one-third of the new capacity required during the period 1965-1975 will use atomic fuels, then we might have from 40,000,000 to 65,000,000 kw of atomic-power plants by 1975. That is difficult to visualize at this time, when there is not even one commercial atomic plant and there is so much question concerning the ultimate economics. The very great world-wide interest and effort being devoted to the development, however, may bring about rather startling results.

On the other hand, 40,000,000 to 65,000,000 kw of atomic generation in 1975 would still be only a small part of the expected total capability of 301,000,000-423,000,000 kw which will be required for the interconnected power systems. If used to the maximum possible extent for base loading, this capacity in atomic-fuel plants could generate less than 25 per cent of the total power needs. The conventional fuel-burning and hydraulic plants we are building now and will build in the future will serve out their normal economic life.

We are continually hearing about the direct conversion of atomic energy to electricity, and about other devices which may make obsolete our present conception of the use of atomic energy as a source of heat. One recent announcement is the strontium battery, which has a capacity of only one-millionth of a watt.

Obviously we do not know what the future may bring in the matter of scientific advancements; but scientists tell us that no "direct-conversion" device discovered up to now holds any real promise for the foreseeable future. If atomic energy is to be an important factor in the power industry within the next 25 years, it will be primarily through the use of heat released by nuclear fission, or possibly fusion.

Other Engineering Factors

The engineering problems of the next quarter century are by no means limited to the installation of additional generating capacity. The greatly increased use of power will present a challenge in the matter of transmission and distribution, particularly in the heavier populated areas. Even today difficulty is encountered in obtaining rights-of-way for overhead lines, and underground construction of adequately high standards is costly.

We are meeting similar problems today, in part, by resorting to higher transmission voltages. It is likely that 400,000-v lines will be reasonably common within the next 25 years and that many transmission systems now limited to 60,000 and 150,000 v will adopt higher voltages to supplement their present facilities.

This type of transmission-line expansion permits great economy in that the newer high-voltage lines provide the main transmission circuits while the existing lines become in effect the secondary or subtransmission lines. In the matter of distribution, higher feeder voltages are being used now than a few years ago and the possibility of 440-220-v service for residences, farms, and small-power customers is being actively discussed. These changes will come as refinements to existing facilities in the never-ending effort to keep ahead of the power requirements.

Business Matters

The growth of the industry and the engineering problems of the next 25

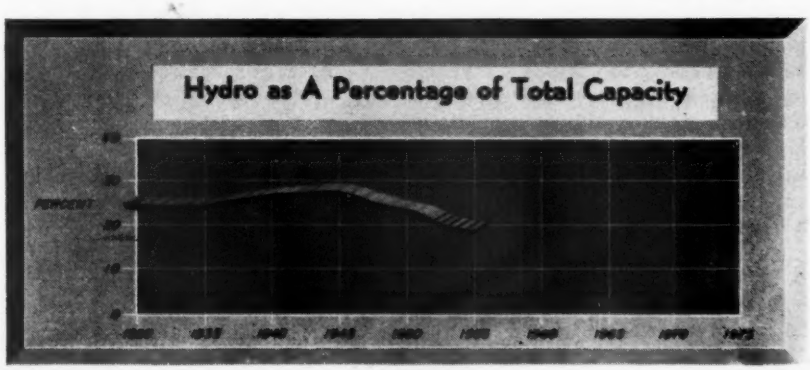


Figure 7

years have been discussed first because they are predictable and in many ways point out the tasks that must be accomplished. There are many other matters, however, which may be even more perplexing and difficult to solve.

As the use of power increases and the population becomes more dependent on it, power systems must assume an increased responsibility to the public. Organizations must be expanded to meet these new and enlarged responsibilities. That in itself is a major problem which must be planned well in advance. The trend for many years has been toward fewer work-hours, longer vacations, and more and more benefits. There is nothing to show that this trend will change. The industry, however, must operate 24 hours each day. Ingenuity will be required to meet this situation.

Competent personnel must be recruited and carefully trained. Lines of authority must be developed to provide efficient and effective operating procedures. This matter of organization will require more and more attention of top management.

The matter of finances for the next quarter of a century will be of continual concern. Expenditures for new plant and equipment by the investor-owned electric power systems was nearly $2,600,000,000 in 1952 and nearly $2,900,000,000 in 1953. About 75 per cent of this has been financed by the sale of new securities.

While the expenditures for new plant may decrease slightly in 1955 and 1956, they inevitably must increase again to keep pace with the power needs. When plants using atomic fuels rather than conventional fuels are built, the required investment will be even greater.

The sale of securities is dependent upon good management and a sound financial condition. The procedures and practices which are involved have changed greatly in the past 25 years and future changes are to be expected. The main problem will be to maintain a satisfactory financial condition which encourages the purchase of securities by investors. That alone is a challenge indeed.

Summary

These thoughts concerning the next 25 years of electric power in the United States may be summarized in the following manner:

1. The use of power in the United States will continue to increase rapidly. We can confidently expect that by 1965 power consumption will be double that at the present time. Beyond 1965 the situation may not be as clear, but those whose business it is to look into the future fully expect the load growth to continue at an undiminished rate.
2. With the greater use of electricity the power industry will come to have a more and more important responsibility for our industrial and economic well-being. The power industry must accept and meet that responsibility by continuing to develop new and improved equipment and operating practices. It must continue to meet peacetime power requirements and, in addition, maintain sufficient reserves to be used in the event of national emergency.
3. From the estimates of load growth presented, the industry will need to install from 7,000,000 to 12,000,000 kw of new generating capacity each year between now and the end of 1965. This is at a slightly lower average rate than was achieved in 1953 and is now expected for 1954. After 1965 the requirement for new capacity to meet load increases may be as high as 11,000,000 to 24,000,000 kw a year. These programs can be achieved only if they are planned well in advance.
4. Atomic-power technology is progressing rapidly and a few large atomic-power reactors may come into operation within five years. A long period of development lies ahead, however, before the engineering problems and economic justification of atomic units can be brought into focus. After perhaps ten years the use of this source of energy for a part of our power supply may become a reality.
   This development, directed in a rational manner, should create no unusual problems for the electric power industry. The industry should take a leading part to avoid unrealistic and wasteful steps which could have disturbing results.
5. The ever-increasing requirements for power will place a heavy burden on the management and operation of power systems. These organizations will have to be expanded in order to meet increased responsibilities effectively and efficiently.

Conclusion

The achievements of the electric power industry during the past 75 years were brought about by the efforts of many people, working together, devoted to their responsibility of providing a service which contributes importantly to our continually improving standard of living. The last quarter of the first century holds great promise of continued advancements. The electric power industry has before it in the years ahead an unrivaled opportunity and a deep responsibility. This is a challenge. And the first 75 years of the Electrical Age have given our industry the necessary experience to meet this challenge.

Charles Coffin Award Won by AGE

(*Continued from page* 178)

tric Power Co.; Indiana & Michigan Electric Co.; Kentucky Power Co.; Kingsport Utilities, Inc.; Wheeling Electric Co.; and Central Ohio Power & Light Co.

AGE was selected as recipient of the Coffin Award after a nominating panel, representing every section of the nation, had reviewed the accomplishments of operating electric companies in 1953. The winner was chosen by a Committee of Judges composed of Dr. James R. Killian, Jr., President of Massachusetts Institute of Technology; C. W. Kellogg, past President of the Edison Electric Institute, and Mr. Sammis.

Established 31 years ago by the Charles A. Coffin Award Foundation in honor of General Electric's first president, the Coffin Award consists of a gold medal and $1000 for the winning company's employee benefit fund. It is presented annually in recognition of outstanding achievements by electric companies as a continuing inspiration to the advance of the industry and service to customers.

People Organized and in Action

C. Hamilton Moses

Chairman of the Board, Arkansas Power & Light Company

An address before the 22nd Annual EEI Convention, Atlantic City, N. J., June 2, 1954

THIS is a great group—a fine forum. You turn the wheels and people work, goods roll forth, and money flows into the markets. And that means profits in the people's pockets and prosperity in the nation.

A thousand times I have urged upon our people that no community and no city and no state and no people can outgrow and outstrip and outdistance and outclimb the composite vision and faith and courage of its public utility leaders. What a compliment—or what an indictment—to say that you so circumscribe the communities in which you live! As we have great vision and faith and courage, so will our territories grow. But if we are little and sorry and sordid citizens they will slowly die.

If there ever was a time, in all the centuries, when any nation had a date with destiny, that nation is America, and that time is now. This is America's date with destiny, and that is your appointment with opportunity. Truly, this is the hour of decision.

"Whose Side Are We On?"

Now, utility people, don't get too puffed up—never self-exalted. If there ever was a group of truly great leaders who were rugged individualists—prima donnas, lone eagles—that's the electric industry. Great warriors when our backs are to the wall—yet, we hesitate to take a stand whenever the government or public opinion is involved. In the presence of entrenched Federal powers we come slowly and tremblingly from the cover. There have been numerous times in the past ten years when we had to ask ourselves the question, "Whose side are we on?"

Yet, you are builders for eternity. In the last 20 years you have done the greatest job of building properties and communities and states of which history has any record. In all the unprecedented production requirements of the last two wars, electric power was the one ever-necessary ingredient, and yours is the enviable record of "never too little nor too late."

C. HAMILTON MOSES

There are too few worth-while state-building programs actively at work in our nation that have been accomplishing great things for their states and for their people. Sure, each utility says it has the best program. I have never yet seen a building and expansion program of any kind mentioned to any public utility executive who did not say, "Well, we've got something better. Your people are different. That won't work in our territory."

Three Worth-while Programs

There are three particularly worthwhile state-building programs that have had a helpful impact upon the economies of their territories. All have done magnificent jobs, literally building zest and hope into the lot and life of the citizens of their sections. All three have been sponsored by electric companies—Monongahela Power Co., Georgia Power Co., and Carolina Power & Light Co.

I want to tell you the story of one other unique program sponsored by one little power company not as large as some of the others, the program not as spectacular. Yes, it's in a small and an inland state, but there are those who love it and work for it. The results are astounding, almost unbelievable.

You must study a map of Arkansas to comprehend the state's development potential. No other state in the nation has been blessed with such geography. In your mind's eye, start in the northwest section of Arkansas—right in the heart of the Ozarks, the highest mountain range between the Alleghenies and the Rockies. There you find beautiful scenery and glorious mountain climate. Then you come off those mountains onto the hills, and then onto the plateaus, and then across the prairies and on down to the great Mississippi River Delta. In this one state you find every type of soil, climate, people, attitude, and raw resource found anywhere in America.

In 1943 our company, by location and necessity, became the spearhead in the public power fight with the Southwest Power Administration. The Interior Department proposed a far-flung Federal power system, covering three times the territory and customers of TVA, contemplating 15,000 miles of transmission line, and in effect, paralleling the transmission properties of the companies of the Southwest. Because most of the proposed hydro power developments were on rivers traversing Arkansas, and since some 85 per cent of the power proposed would be developed either within our state or within 50 miles of our borders, our company naturally became the front porch for this Federal encroachment conflict.

Strenuous Action Needed

On the basis of the statistics by which we measure the economy of the people, Arkansas had long been low in the scale—at the very bottom, except for our sister state of Mississippi. We felt these discouraging prospects required strenuous action. We wondered what one little company could do to sell the people on the fact that private industry could build a better prosperity than any Federal authority.

We believed our people would join in an honest-to-goodness statewide organization for that purpose. So, we called together the state's leadership, urged that they get right at heart and march militantly forward to help their state take its place in the sun.

So, we formed a statewide organization known as the Arkansas Economic Council, representing every segment of our society. It was later combined with the State Chamber of Commerce. It now has some 1500 members from every county in the state, and the modest annual budget of some $70,000 per year. It gets much assistance from various state organizations.

Business-Government Venture

Our Economic Council organized its own program, now known as the "Arkansas Build Your Own Home Town Plan." It has won national recognition. We have had calls from all over the nation to come and tell its story.

Then came something new under the sun. Our state government, represented by the Resources and Development Commission and the Arkansas Publicity Commission, joined hands with business, represented by our Economic Council-State Chamber of Commerce. Our state government loans us two full-time men free of charge and many members of various state boards devote much of their time to carrying out the program. Here were government and business jointly marching forth to help communities help themselves.

Citizens in Action

The heads of our bigger institutions, representing every field of endeavor, together with representatives of various state agencies, went to all the communities in Arkansas. We called together the leaders of each community, ofttimes at three meetings a day, from 100 to 300 at a time, and talked over our common problems. Our principal purpose was to inspire the leaders of every community to organize their own local know-how, their local capital, and their local labor and process their own raw resources into the finished products for their local and other markets.

A thousand different times I went to the various communities in our state, calling together the local leaders and literally begging our people to stand up and be counted—to get out and be somebody. We urged the citizens of every town, "Make no little plans. They do not have the magic to stir men's souls. Make big plans, bold plans, and then find the way to carry out those plans."

We told them the story, printed in a civic magazine, about the country banker who called in an architect and city planner. He said, "I want you to appraise this territory and our people, see what we have and what we can do with it—what kind of town we could build if we had the capacity of planning our future and then working together."

The job was done, and he put in his bank window a beautiful panorama picture of that town of the future. The citizens asked, "What is that?"

The banker replied, "Read the legend. That's our town 25 years from now."

They said, "You're crazy. That's a beautiful little city. Our town will never look like that."

The banker said, "Well, then, I've made a mistake. I've uselessly spent $2500 of my bank's money. But, that's the faith I have in you people and in my town."

Remodeling Begun

Within a few months the leading department store in the town, a rather shabby-looking building, burned to the ground. The owner of the property called in that same architect, and said, "That's my property. I want you to reproduce my building just like it is in that picture." That was done. It was a beautiful thing. Business greatly increased.

You already know what happened. The owners of those shabby fronts on each side of the new building called in the architect and said, "Fix my building just like it is in that picture." That was done and their business increased. The magazine article said that within 15 years the little town would grow into what the picture showed and what some citizen dared dream could be done. The idea caught fire in many towns and great was the transformation.

Then our men came forth with the novel idea of a community clinic, a town-building school. We had four men (furnished by our company and the Resources and Development Commission) specially trained to go into a town and get some sponsoring organization to call together groups of some 40 citizens at a time for an hour's clinic. These men would stay just as long as people would attend the clinics—even days at a time. The attendance at these community clinics ran from 259 to 3000.

People Designed Program

In these clinics each citizen would vote for the projects he thought his town ought to have—the long-term and the short-term, what was needed most. These projects were codified, putting first things first, and turned over to the sponsoring organization. Then it could come forth with that town's program, its blueprinted future. That was not any board's program. It was the people's program, and people will work for their own suggestions.

In one town there had been 40 different committees working on various civic projects, maybe all good but maybe at cross-purposes. Out of a clinic came one over-all, well-designed program, all groups putting first things first and all working together. More than half of this town's ambitious program has now been accomplished.

In Arkansas, 250 different towns built their own programs, drew their own blueprints, fixed their own goals, and went to work. Twenty thousand community-building projects were put on the workboards. Ten thousand are already accomplished. New projects are being born every day. The concrete results are nothing less than astonishing. Here is a people on the march.

Rural Development Program

Our power company rural development men, after going all over the nation to study various projects, came forth with something else new under the sun—a rural development program. This program was sponsored by the Arkansas Press Association, the University of Arkansas Extension Service, and Arkansas Power & Light Co. Here are our state's leaders, with trained personnel to follow up, calling together rural people and urging them to plan their own future, to make out of their rural areas just the kind of

communities in which they want their children to live.

Three hundred different rural communities have already organized and are now at work. In Greene County—and there our company does not serve a single light bulb—33 different communities have already organized and are literally transforming the rural life of that county. I am told that within a period of five years, we will have more than 800 rural communities organized, with fixed goals and blueprints for the future, actively on the march.

The people in these communities are being somebody. They are building better places for their families' future. They are not for government ownership. They want to do for themselves and stay away from Washington. This is democracy in action.

"Plant For Better Living"

We have another novel idea on the move in our state and it is touching many people in many sections. For some five years, we have pushed a special "Plant For Better Living" campaign. This has been modeled after the *Memphis Commercial Appeal's* "Plant To Prosper" campaign, which is one of the most effective agriculture-building programs in the nation. This program is jointly sponsored by the various farm agencies, the Arkansas Press Association, the Agricultural Extension Service, and Arkansas Power & Light Co.

Statewide Contests Conducted

Our men conduct a statewide contest offering some substantial prizes to determine the progress in various groups—white and colored, tenant and owner—to determine who can do the best job in budgeting their operations and building a better way of life on the farms and in the rural areas.

The first year some 15,000 different farmers entered the contest. Up to date more than 60,000 have participated in this movement. Great benefits have resulted in many sections and on many farms.

Our company offers several thousand dollars in prizes for annual contests in both divisions—the towns and the rural areas—and in the "Plant For Better Living" campaign. Some 150 towns and 140 rural communities have entered the contests from year to year, each vying with the others as to which could build a better way of life and living.

When the contests are over, our company has two-day annual meetings for each group in Little Rock for the awarding of the prizes. From 500 to 600 attend these meetings. We provide the best talent we can find to show both urban and rural groups how they can do a better job of building better communities and bigger business and more prosperity, always with particular emphasis on social, educational, cultural, and spiritual values.

Rural Community Schools

Our company, more vigorously, I believe, than any other company in our territory, has sponsored special rural community schools that have paid off in a big way. We have two men for each of our seven divisions who are especially trained in the art of holding these sessions in rural areas. These school meetings are held in churches and schoolhouses, or maybe in homes, or in the shade of the trees. These men, in conjunction with various farm agencies, hold these rural gatherings five nights a week, generally with 100 to 150 people present. As many as 600 have been in attendance.

These men give lectures and demonstrations on five different phases of rural life. They pick the activity in which the farmers of the area are most interested, such as poultry raising, dairying, house wiring, and water uses.

All the adults in attendance register and their names are given to all the appliance dealers in the area with the idea of promoting sales. At these meetings, however, the school conductors give the story of our company—its effort to build Arkansas—and urge that all the people work with us in that effort.

Sell Free Enterprise

They also try to sell the people on our enterprise system, how it has made the average American the envy of the world. They particularly try to show that our company will and can do more for them and their future than any government-ownership group.

These men hold an average of more than 4000 meetings annually, with some 200,000 adults in attendance every year.

This over-all state-building program includes a number of other activities, such as soil conservation, livestock development, farm tours, county fairs, 4-H Clubs, Future Farmers of America, co-operation with vocational agricultural teachers, and rural electrification.

Arkansas Power & Light received the Charles A. Coffin Award Citation in 1953 for its outstanding program of community and agricultural development. This has been an enlightened self-interest effort that has enrolled thousands of citizens and will surely mean more income for our people and more money for our company.

All these activities bring state pride and loyalty; more co-operation and participation among various groups and associations; a wholesome influence upon the leadership of the state; national publicity that could not be bought for cash; and, finally, an increased sale of kilowatthours, which is inevitable when the people keep pace with growth and development. What began as a postwar planning project has become a gigantic sales program participated in by large segments of the population of our state.

Lights to Farmhouses

Our little company, for its size, number of customers, and investment in property, has carried lights to more farmhouses than any private utility in America. Our men suggested, "You have forgotten the cost formula." (Executives know that business does almost everything by formula, by figures, by statistics—forgetting the human element.)

Our company encouraged rural electric co-operatives to develop many territories that we could not well reach. In some ten years, Arkansas has moved near the top in rural electrification, 90 per cent of all the farmhouses in our territory now having electricity available.

You have already been asking, how much does all this activity cost? How does it affect your earnings? How is it reflected in the balance sheet? "Utilities are not social policemen nor political reformers," you say. "We have got to make everything we do pay its own way."

We hesitantly and humbly state that not one mile of competing electric line has been built in our territory; we serve every rural electric co-operative in our area. A master

generating and transmission co-operative was authorized by REA to be built in Arkansas, but it was held illegal by our State Supreme Court, and the project has been abandoned.

Let me give you a little human interest story. In Jackson County, Ark., one strong rural electric co-operative determined to create a Public Utility District to condemn and take over all the electric property in that county, including the local electric co-op lines. Our property was not for sale. The issue went to the ballot box, and we had to go to the people.

Co-op Had Wide Backing

The local co-operative served more rural customers than our company. The co-op had the backing of the public-power proponents of the nation all the way from Washington down to Newport, Ark.

At 7:30 every morning, when you turned on the radio, the announcer would say, "The next voice you will hear is the President of the United States." Then President Truman would come on the air for the purpose of influencing the people of Jackson County to vote for that Public Utility District. Then the announcer would say, "The next voice is the Secretary of the Interior in Washington." Then again, "The next voice is that of Senator Lister Hill of Alabama," all pleading with the people of one Arkansas county to vote for a Public Utility District to condemn and take over private property.

I traveled every highway in Jackson County, visited many homes, and went out to the fields and helped pick cotton. Our men had previously helped organize 14 rural development programs in the county. Those people there did not care anything about Hamilton Moses, but they did recall that the power company men had helped set up their community development program and had worked with them in various community undertakings.

Yes, this community work and these rural lines paid off in a big way. The people of that county voted 4½ to 1 against the Public Utility District, regardless of Senator Lister Hill and Secretary Chapman and even President Truman.

But you say, "Oh, maybe it does pay politically, but what about economics?" Well, we have hundreds of great stories, some of the finest business romances of the nation.

Take the town of Dardanelle, Ark., with a population of 2000 and once given up to die. Some ten years ago the citizens were called together for a citizenship meeting and later for a community clinic. They decided to see what could be done. In seven years, Dardanelle has become one of the most prosperous sections of our territory. The citizens built up their livestock and poultry industry. This called for a feed mill, then a chicken-processing plant, then a cold-storage plant, and then a rendering plant. Now Fox Foods have installed one of their fine operations, furnishing Ozard chickens for the tables of the nation.

At Brinkley, Ark., a city of 4000 halfway between Memphis and Little Rock, they could not get started. It seemed that everything went wrong. We called the citizens together in a meeting to discuss their problems. We challenged them to fuller citizenship effort. The group organized, made definite plans, went to work. Now they have completed more than a dozen community-building projects.

Brinkley Almost All Rebuilt

The citizens of Brinkley literally revamped and rebuilt their public school system and all their churches. They now have a new county hospital, to which they contributed $100,000. They are now building one of the fine libraries in that section, largely from the gifts of local citizens. They have just completed a $250,000 building to be rented to the Phillips-Jones Corp., which will shortly start the manufacture of Van Heusen shirts, giving employment to 250 people. The whole section is looking up and there's prosperity on every side.

Do you like fairy stories? Do you want to witness a Walt Disney business fantasy unfolding in a very small town? Then visit Decatur, Ark., which has a population of 356. Its little processing plant ceased to operate. Business went down. Everybody was discouraged, and then a meeting was called. The citizens were challenged to take their own marvelous resources and use their own local capital and do something about it.

They went to work. Streets were paved, schools and churches rebuilt. A bank was organized and is now in successful operation. A little creek that ran through the town was an eyesore. The citizens beautified the creek, made the area around it a city park, and built there one of the fine swimming pools of the state. A few citizens joined together in constructing a building for lease to the Seymour Poultry Co., now processing some 17,000 chickens a day. This prosperity is spreading to other towns.

This little town won first prize in the 1953 "Build Your Own Home Town" contest. We asked the committee, "How can such a little town do such a great job?" The reply was, "We love our town."

Then, further on economics, they tell us there are some 12 factors by which you measure the economy of a people and the progress of an area. We have had our men check what was being done in Arkansas, as compared with other parts of the country. We were surprised to find that in every one of these factors, the little State of Arkansas, percentage-wise, led every other state in our region.

But Arkansas also has troubles. There sits that inland state, with Texas and all of its wealth in black gold on one side, and Tennessee with all of its Federal preferences and cheap power rates, financed by the taxpayers of the nation, on the other.

If TVA paid taxes and the cost of money, just like the other utilities with which it competes, it would now be running at a deficit of from $50,000,000 to $90,000,000 a year, depending upon the rate of interest and how you calculate its taxes. These huge deficits are now being passed on to other sections of the country. And that's not right, in anybody's language.

TVA Financing

For a number of years, the Congress has been appropriating from the Federal Treasury some $3,000,000 to $7,000,000 per year as a special development fund for the Tennessee Valley. A Chattanooga newspaper quoted former Chairman Clapp to the effect that if this fund is denied, some 344 employees, devoting their time to the development of that territory, must be taken from the payroll.

Why should the Federal Treasury finance the expansion and development and betterment programs of one

(*Continued on page* 223)

Preference Clause—Santa Clause to the Favored Few, But Paid For by the Nation

George M. Gadsby

Chairman of the Board and President, Utah Power & Light Company

An address before the 22nd Annual EEI Convention, Atlantic City, N. J., June 2, 1954

A FEW basic facts are necessary in order to view in proper perspective the development of the preference clause and the discriminatory practices conducted in its name. To begin with, electric service, as perhaps nothing else, is entirely local in so far as the consumer is concerned. No matter where the power may be generated or how far it may be transmitted, its delivery and use is at one specific location for each customer. These customers are spread all over the United States, and in their individual capacities are taxpaying citizens standing equal before the law and entitled to share equitably in all benefits provided by the Federal government. True, the welfare clause in the Constitution has disintegrated from "general welfare" to specific gifts and grants in unequal proportions to various segments of the people. But the fundamental conception is still there.

A second basic fact, if discrimination be present at any point in the electricity supply system, is that the discriminee is the ultimate consumer.

A third generalization: when the consumers, 80 per cent of whom are now cut off from participating equitably in the purchase of Federal power sold at low prices, wake up to the injustice being done them, the fight of the investor-owned companies on their behalf will be won.

Causes of Rate Differences

In the days when free enterprise was in full swing, rates over the country were not uniform, but the difference was due to varying production costs, local taxes, and character of loads. Now, to an increasing degree, differences in rates, i.e., the cost to the user, are due to tax exemptions. government subsidies, and favoritism.

No further proof is needed of the seriousness of situation than to note that the Federal government is now operating and marketing power from

GEORGE M. GADSBY

75 hydro and 12 thermal generating plants, tax built but tax free, and is now adding 24 hydro and three steam stations, all of large capacity. Many of the hydro and all the thermal stations are "incidental" to no constitutional purpose, and should not be so incidental to the nonfavored citizens who are required by taxation to give up their hard-earned money to pay for them.

No investor-owned company will be hurt or placed in an unfavorable comparative position if every power producer and distributor will stand on his own feet at the same tax level. Let TVA do its own financing in the open money market, pay its fair taxes, and sell its output on a free competitive basis. In other words, from here on out give the Federal taxpayer a break.

As we well know, discrimination begins in the construction stages, and to quote Dr. Goldsworth Dickinson, "Every kind of discrimination is a protection of the incompetent against the competent, with the result that the motive to become competent is taken away."

And again, perhaps idealistically, "All modern societies aim to some extent, at least, at equality, that this tendency, so far as it is conscious, and avowed, is not to separate off a privileged class of citizens, set free by the labour of others to live the perfect life, but rather to distribute impartially to all the burdens and advantages of the State, so that every one shall at once be a labourer for himself and a citizen of the State."

Now let's see how this has a bearing on the preference clause. Why do the present beneficiaries hang on for dear life and yell "unfair," "power trust," and "give-away" whenever some one has the temerity to suggest that the benefits of taxpayers' investments (involuntary though they are) be distributed among all taxpayers?

The answer is obvious. It's cheaper that way!

Disraeli said, "A precedent embalms a principle." So the professional public power boys have assiduously attempted to set up the precedent and embalm the principle that Federal power belongs to the Federal government tax free.

A Look at the Record

To pick up a phrase of a quarter century ago, "Let's look at the record." Constant efforts are made to establish a precedent going back to the Reclamation Act of 1906, but it's a far cry from the wording and intent of that Act to the present-day claims of the public power advocates that all power generated at Federal projects belongs in perpetuity to customers of the co-ops and other Federal tax-exempt or tax-supported agencies.

In 1906 Congress, in amending the original Act of 1902, said:

"Lease of Water Power. Whenever a development of power is necessary for the irrigation of lands, under any project undertaken under the said reclamation law, or an opportunity is afforded for the development of power under any such project, the Secretary of the In-

terior is authorized to lease for a period not exceeding ten years, *giving preference to municipal purposes*, any surplus power or power privilege, . . ."

This conferred no special privilege on any group of citizens. Regardless of who bought the power, it was to be used first for municipal purposes, with no further restriction on supplying other users or discrimination against one group of users for the benefit of others. And that's the precedent claimed for embalming the special privilege of cheap—by reason of freedom from taxes and normal free market interest—power for the exclusive benefit of some 20 per cent of all the American users of electricity.

The Rivers and Harbors Act of 1912 authorized the Secretary of War, upon recommendation of the Chief of Engineers, to provide means for the future development of water power, but no preferential treatment of certain customers is even mentioned.

The Federal Water Power Act of 1920 contained a preference to states and municipalities which applied for licenses to build their own hydro power developments which were deemed by the Federal Power Commission to be well adapted to conserve and utilize in the public interest the water resources of the region. No restrictions here on the distribution of the power as between favored and nonfavored classes of customers.

Boulder Canyon Act

The Boulder Canyon Act of 1928 is clean-cut, and says:

"(c) Applicants for purchase of water and electrical energy; preferences.

"Contracts for the use of water and necessary privileges for the generation and distribution of hydroelectric energy or for the sale and delivery of electrical energy shall be made with responsible applicants therefor who will pay the price fixed by the said Secretary with a view to meeting the revenue requirements herein provided for. In case of conflicting applications, if any, such conflicts shall be resolved by the said Secretary, after hearing, with due regard to the public interest, and in conformity with the policy expressed in the Federal Power Act as to conflicting applications for permits and licenses, except that preference to applicants for the use of water and appurtenant works and privileges necessary for the generation and distribution of hydroelectric energy, or for delivery at the switchboard of a hydroelectric plant, shall be given, first, to a State for the generation or purchase of electric energy for use in the State, and the States of Arizona, California, and Nevada shall be given equal opportunity as such applicants.

"The rights covered by such preference shall be contracted for by such State within six months after notice by the Secretary of the Interior and to be paid for on the same terms and conditions as may be provided in other similar contracts made by said Secretary . . ."

This language contains no discrimination among consumers and the Boulder Canyon Project has shown from its beginning the most satisfactory results of any of the Federal projects.

We'll pass the TVA Act of 1933 as it embalmed, not a precedent, but as Norman Thomas said, "The fairest flower of socialism."

REA Act of 1936

The REA act of 1936 is not a power-producing enactment, and its stringent preference provisions relate to Federal loans of tax money. Later, by ultra-legal misappropriations from REA funds it was twisted into one of the most iniquitous developments in the campaign of preference for the few. However, this was in no way the fault of the Act, the Congress which passed the Act, or the farmers for whom it was passed and who have to assume the liabilities for the advances made under the Act. The cross-loan idea was conceived by the planned-economy, welfare-state protagonists then in power in Washington. The REA act confers no preference upon any group of power users. The REA co-operatives can buy and sell power from and to anyone of their choosing without preference.

Bonneville Project Act

The Bonneville Project Act of 1937 is, of course, a New Deal enactment and goes all out for preferences within its local service area. One of the greatest *non sequiturs* in all legislation relating to electric power is in the general preference clause of this Act. It reads:

"(a) In order to insure that the facilities for the generation of electric energy at the Bonneville project shall be operated for the benefit of the general public, and particularly of domestic and rural consumers, the administrator shall at all times, in disposing of electric energy generated at said project, give preference and priority to public bodies and co-operatives."

We can only conclude that Mr. Ickes turned his back on all statistics and ignored the consumer records of The Washington Water Power Co. and the other Pacific Coast investor-owned companies serving the areas involved. These companies were outstanding then, as now, in area coverage and rural and residential use of electric energy. Their sales promotion has been tops. Even the sales efforts to socialize the power business in the Pacific Northwest conducted by the late Dr. Carl D. Thompson, who was once advanced as a presidential candidate on the Socialist ticket, and others on the BPA payroll were inferior to the results of those local companies in promoting "the benefit of the general public, and particularly of domestic and rural customers."

In the Fort Peck Project Act of 1938, the same language occurs as in the BPA Act. Those words, "for the benefit of the general public and particularly of domestic and rural consumers" had been found effective. To quote Wentworth Dillon:

"Man ever had, and ever will have leave,
To coin new words well suited to the age."

By the same token, the right combination of words are oft well suited to the age!

Proof of Real Motive

The effective work done by The Montana Power Co. in spreading the use of electric service among domestic and rural consumers throughout the state is proof enough that the real motive back of the preference clause was to promote the well-laid plans for a public power system overriding and duplicating the systems of the investor-owned, taxpaying companies.

The Reclamation Act of 1939 discards all pretexts and enumerates the preferences for public ownership, co-ops, and REA's with no reference to tail-end private companies. By this time the public power advocates were in the saddle.

Before the enactment of the Flood Control Act of 1944, an attempt was

made to restore some balance for the customers of the investor-owned companies, but the pressure of the administration was too great, so the Act as passed provides flatly that "Preference in the sale of such power and energy shall be given to public bodies and co-operatives."

There was a gesture towards preventing wasteful duplication of transmission lines in language providing for the building of "only such transmission lines and related facilities as may be necessary in order to make the power and energy generated at such projects available in wholesale quantities for sale on fair and reasonable terms and conditions to facilities owned by the Federal government, public bodies, co-operatives, and privately-owned companies." The Department of the Interior, however, paid little attention to this provision and spent large amounts of money building unauthorized lines to form a widespread nationalized power system, until brought in check by an irate committee in the House which called the Secretary, the Commissioner of Reclamation, and some of his field men to account. An adequate explanation was never made, but the starting of unauthorized lines out of carry-over appropriations was stopped.

The Ickes Memorandum

The whole socializing plan of the Department of the Interior was exposed in the notorious Ickes Memorandum of 1946, the first paragraph of which stated:

"(a) Active assistance, from the very beginning of the planning and authorization of a project, shall be given to the organization of public agencies and co-operatives for the distribution of power in each project area. The statutory objectives are not attained by merely waiting for a preferred customer to come forward and offer to purchase the power."

And again in paragraph (f):

"(f) No contracts shall be made that operate to foreclose public agencies and co-operatives from obtaining power from the government project. Contracts with these organizations shall recognize their preferential character and assure them full opportunity to secure the benefits of Federal power. Contracts with privately-owned companies shall be limited in time and shall contain provisions for the cancellation or modification by the government as necessary to insure preference to public agencies and co-operatives."

This consistent moving from the sale of power for municipal purposes to the outright socialization of power on a national scale was an inherent purpose of the New-Fair Deal and was intended to put the Federal government in an all-controlling position in the field of electric power and energy and thereby in control of the industrial development of the nation. Proof of this is apparent, not only in the preference for public power, but for the selection of favored industrial concerns. Bills were introduced repeatedly to carve the entire country into seven power authorities which would have supreme dictatorial authority overriding all state regulatory commissions and putting in control men appointed by the President and holding office during his pleasure. Fortunately, not only for power users, but for the whole national economy, the Congress refused to permit this crowning move into dictatorship.

Time for a Change

It was truly time for a change. A start back to freedom and toward impartiality under the American system of enterprise has been made. To begin with, it has been made clear that the Federal government does not have and never has had the responsibility of providing electric service to whatever extent needed by a given area or by particular classes of distributors and consumers.

On January 21, 1954, the Solicitor of the Department of the Interior, when before the Senate Committee on the Judiciary, after reciting the pertinent parts of the many acts relating to Federal power projects, most of which I have already discussed, summed up the position of the Federal government as a power supplier as follows:

". . . There is, of course, a grave constitutional question involved in the unlimited extension of the Federal government in the power business . . . It is true that subsequent to that time (Supreme Court decision in the Aswander Case) the Congress has authorized, under limited circumstances, some construction of electric works as such, particularly in the Tennessee Valley, but certainly, the Congress has never passed any legislation authorizing the Interior Department to engage generally in the electric business, and, therefore, the repeated statements of the witnesses that the Department's power policy was defective because it 'denied utility responsibility' or 'abandons the old policy of taking care of the growing needs of the rural systems' or that it 'tells co-operatives to look elsewhere for growing needs' are very fallacious statements from the standpoint of the legal powers of the Department. It has never been authorized so to do. No money has been appropriated to enable it so to do, and it is not appropriate that criticism should be made of the Department on the ground that it has not fulfilled obligations which it is not authorized to perform."

Screams of Dismay

Every time a move is made to keep the functions of the Federal government in their prescribed field, or to equalize the benefits among all citizens and taxpayers, the few, but well-organized, special beneficiaries become vocal and by means of carefully planned demonstrations have thus far been successful in maintaining their privileged position. When the power policy was enunciated by the Secretary of the Interior in August of last year, it was met with screams of dismay of which the following are typical:

Clyde T. Ellis, Executive Manager of the National Rural Electric Cooperative Association, said:

"It seems apparent that the heretofore dynamic Federal program of developing the country's rich hydroelectric resources and selling power in such a way that the people get the benefits is going down the drain, one license and one contract at a time." (*Electrical World*, Sept. 21, 1953)

Again:

"Interior's new power policy means 'less power for the people, higher prices, and further encroachment of the already overwhelming power company monopoly—a body blow to the farmers' electric co-ops and power districts in particular and to the economy of our country in general.'" (Statement before Senate Subcommittee on the Judiciary, Mar. 2, 1954)

And again:

"I, therefore, submit that Inte-

rior's new policy and marketing criteria are strong evidences that the Federal wholesale power program of the United States is now to be starved, stunted, dismembered, and discredited." (Statement before Senate Subcommittee on the Judiciary, Mar. 2, 1954)

No Proof Offered

There is no basis or proof offered for these conclusions of the witness, but they registered just the same.

Another familiar voice in the ranks of those advocating socialized power is that of Leland Olds, who stated in the *New Republic* magazine, September 14, 1953:

"So the nation's water power is to be turned back to the private power companies travelling under the alias of 'local interests.'

"The Eisenhower policy represents a complete reversal of this approach.

(The 1946 Ickes directive.) "Existing municipal electric systems, PUD's, and REA must either depend on higher cost power supply from competing private systems or build their own small uneconomical local generating stations to meet their expanding needs. Newly-organized public or co-operative systems will apparently be deprived of Federal power supply altogether."

Again No Proofs

Again by Alex Radin, General Manager, American Public Power Association:

"If there were no preference clause, and if Federal power were sold at the dam site to those who could come and get it, we would find that practically all of this power would be going to the private power companies, with very little to the public agencies." (Senate Subcommittee Hearing, Mar. 4, 1954)

Again there are no proofs or facts advanced to support the conclusion of the witnesses. The list of these cries of distress over being moved away from the Federal power sources or at least being required to share them with the other 80 per cent of electric consumers now being shouldered aside could be extended almost indefinitely. But nothing would be proven except the human characteristic, shared with some other animals, of squealing when pulled away from special privilege and using unfounded statements and conclusions to influence public opinion adversely and thereby the cause of justice in the halls of Congress.

At other times really smooth procedure takes the place of propaganda. In the May 3, 1954, *Electrical World* there appeared an article entitled "Preference Issue Debated," which refers to the bills introduced into the House and Senate to provide for marketing power from Falcon Dam on the Rio Grande River. Brief hearings were held with no opposition.

"After these hearings were closed, Clyde T. Ellis, Executive Manager of the National Rural Electric Cooperative Association, submitted a statement which went into the record without comment or opposition testimony. Ellis asked:

" 'First, that if an amendment be adopted to the bill it should provide that if any power is sold from this project to non-preference customers, that it be sold by the marketing agency upon the condition that the preference customers shall have the right to such power upon showing a need for the power in the future, and that this right shall be protected by the so-called "recapture or withdrawal clauses" in any such sales contracts.'

"It was in the Senate that the Ellis suggestion was nearly adopted by the Senate Public Works subcommittee.

"Hearings lasting only 10 to 15 minutes were held on the bill. It was approved by the subcommittee and a tentative favorable report was prepared. The matter came to the full committee late last month.

"At that point, Sen. Wayne Morse (Ind.-Ore.) moved into action. As requested by Ellis, Morse asked to have the Ellis interpretation of the preference clause incorporated into the report which would accompany this bill to the Senate floor.

"The committee had already nodded approval when Sen. Francis Case (R.-S. D.) came into the room. He succeeded in holding up the report containing the Ellis language until Interior could make a study and comment on it.

"If the Ellis move had succeeded, and there is still a possibility that it can, it would seem to ban any firm contracts for the sale of Federal power to private utilities or industries. It would give public power groups and co-ops a first and continuing priority to purchase Federally produced power."

This would establish for the very much preferred customer a permanent title in all power from Federal projects, with the further advantage of not having to pay for power reserved until it could be resold by the publicly owned and co-op distributors. The readiness-to-serve charge during the waiting period would be paid by the taxpayer. Nice going for the public power boys, but they never hesitate to ask or even demand those special privileges.

Political Entities

Considering the minority status of the favored few, it is amazing how preference in selling Federal power has taken root and grown. Perhaps one answer is found in the fact that the customers of the PUD's, municipalities, and co-ops are political entities and can operate as such. The customers of the investor-owned companies are not and cannot be even loosely organized into political groups having equality in government power sales as their objective. In fact, the small part of the budget represented by the electric bill and the good quality of service relegates any problem about electricity to a place outside the field of interest of the average company consumer. Any corrective approach must, therefore, follow some other course which will be of interest to the customer as a citizen and taxpayer. Recent opinion surveys support this conclusion.

Fair, Appealing Principles

There are definite principles which can be vigorously advocated and whose fairness will be appealing. Let me enumerate a few.

The deficit in the power bill not paid by the preference customer, or by TVA, is made up out of tax money paid in part by the people of your community. If they knew this and were given an approximate idea of how much it is, they would not like it.

No objection is made by the investor-owned companies because of the form of organization of the power distributors, but they do not agree with the efforts of the professional political promoters vociferously making "sacred cows" out of their clients, the PUD's, co-ops, and other preference distributors.

The low price of government power

(*Continued on page* 225)

An Appraisal of the Market for Long-Term Capital

A panel discussion by . . .

Grant A. Martell
Vice President, Investment Department, New York Life Insurance Company

Robert Driscoll
Partner, Lord, Abbett & Company

Alvin Schlosser
Vice President, Blyth & Company, Incorporated

F. W. Page
Vice President, Tri-Continental Corporation (Moderator)

Presented before the 22nd Annual EEI Convention, Atlantic City, N. J., June 2, 1954

STATEMENT BY MR. MARTELL:

The market for long-term capital is constantly changing. One of the factors which should be examined in appraising this market is the relationship of the source and use of capital funds.

According to estimates which have been supplied to me, the use of capital funds will total about $32,700,000,000 in 1954. This is made up of the following:

U. S. Government Bonds	$8,500,000,000
State and Local Bonds	$4,500,000,000
Corporate Bonds	$7,000,000,000
Mortgage Loans	$9,600,000,000
All Other Loans	$3,100,000,000

The total use of capital funds in 1954 will probably be little, if any, below last year, but there will be a shift in the composition of the demand from the private to the public sector; that is, into U. S. government, state, and municipal issues.

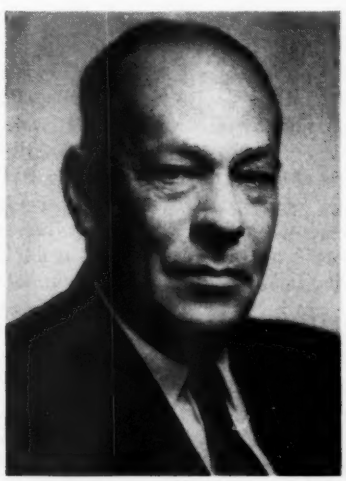
FREDERICK W. PAGE

In addition to borrowing some $3,000,000,000 from social security accounts, the U. S. government will borrow some $5,500,000,000 from the general public this year. Since the Federal government will retire about $5,000,000,000 net of marketable debt in the first half of 1954, it will need to raise about $10,000,000,000 of new funds in the second half of this year if it is to keep its balances at a normal level. Thus, the U. S. Treasury will be a major competitor for investment funds during the balance of this year. The principal suppliers of funds to the Treasury will be the commercial banks and the Federal Reserve System.

The source of capital funds in 1954 from nonbanking sources is estimated to total $28,300,000,000, leaving a deficiency of $4,400,000,000 to be supplied by commercial banks, roughly the amount supplied by the banks to the

GRANT A. MARTELL

ROBERT DRISCOLL



ALVIN SCHLOSSER

capital market last year. The principal sources of nonbanking funds will be individuals for $6,400,000,000; life insurance companies, $5,200,000,000; savings and loan associations, $3,500,000,000; and U. S. government investment funds, $3,000,000,000.

It is to be noted that life insurance companies will provide approximately $5,200,000,000 or 18 per cent of the estimated $28,300,000,000 which will be available to the capital market this year from nonbanking sources. One should remember that U. S. life insurance companies owned more than $9,000,000,000 of U. S. government securities at the 1953 year-end, some portion of which they would not hesitate to sell to meet commitments or to take advantage of favorable investment opportunities, when long-term Treasury 2½s are above par.

Thus, life insurance companies may be even larger sources of long-term capital funds for industry this year than I have indicated. It is no accident that the life insurance companies have been, and will continue to be, large reservoirs of the people's savings and, hence, a major source of funds to the capital markets. This never completely-emptied reservoir of capital funds is the direct result of continuous selling efforts by thousands of insurance salesmen throughout United States and Canada.

Rapid Decline in Bond Yields

Although a source and use analysis, covering several years, is of some help in appraising the trend of long-term interest rates, it would have been of no help in anticipating the remarkably rapid decline in bond yields which occurred since the high levels reached last June. However, two other signals were significant. First was the political rumbling resulting from the decline well below par last summer of the new Treasury 3¼s of 1983-78 and interest rates above 4 per cent on new bond issues of good corporate borrowers. The second signal was the growing interest in new public offerings of public utility bonds, beginning last summer, by certain New England life insurance companies and by one of the large life insurance companies in New York City, indicating that their forward commitments were beginning to run off and their new investment opportunities in the direct placement field were declining. The alert investment banker was not slow to recognize this.

At the third Future-Market Forum last February, J. H. Jewell, Vice President of Sales of Westinghouse Electric Corp., estimated the electric utility industry kilowatthour-sales rate of growth at 7.38 per cent per year or 103.8 per cent in ten years. He predicted an increase in the value of utility plant of $34,400,000,000 in the next ten years. According to EEI estimates, total construction expenditures of the investor-owned electric utilities were only $16,000,000,000 during the past ten years.

Estimates of Capital Financing

Mr. Jewell thought it possible that less than 30 per cent of the new funds can be furnished by retained earnings and depreciation, leaving more than $24,000,000,000 to be financed publicly in the next ten years by the electric utility industry.

General Electric Co. has informed me that, according to its estimates, during the ten-year period, 1954 through 1963, "the investor-owned electric utilities in the United States will spend about $35,000,000,000 on new construction and that in order to finance this construction they will need approximately $25,000,000,000 in new capital, the remainder to be paid for out of depreciation and retained earnings." General Electric commented that "this rate of new capital financing would be 50 per cent higher than the average rate for the five-year period, 1949 through 1953, and about 90 per cent higher than the average rate for the eight postwar years, 1946 through 1953."

A form of financing which does not show up in the usual compilations is the purchase-lease transaction. This involves the sale to an institutional investor of land and certain approved types of buildings by the public utility and the simultaneous leasing of the sold property by the utility under a long-term net lease for an initial term of 25 to 30 years. Typically, the lessee has a series of renewal options covering an additional period of 30 years at a much reduced rental. I believe it is true that many electric utilities for the past several years have concentrated their attention on adding production, transmission, and distribution facilities, and now find themselves deficient in general - office and division - office buildings, service buildings, and the like, which in some cases lend themselves to a purchase-lease type of financing.

It should be remembered that the electric utility must compete with other sectors of the economy for capital funds. With indications of declines in held orders for telephones, telephone utilities may become less important contenders for new capital over the coming few years. The same should be true of industrial corporations and may be true of mortgage-loan borrowers. On the other hand, municipalities, public agencies, and the Federal government will seek large amounts of new money.

Although life insurance companies have purchased approximately $1,100,000,000 of public utility bonds during each of the last three years, such purchases were sharply lower than during the three preceding years, 1948, 1949, 1950, when total gross purchases of public utility bonds were $2,000,000,000, $1,400,000,000 and $1,600,000,000, respectively. Relatively, the decline was even more striking.

As a percentage of total public utility bonds issued, life insurance company public utility bond purchases decreased successively from 75 per cent of the total in 1948 to 38 per cent in 1953. However, there are indications that the downward trend is being reversed.

Purchases Erratic

Life insurance company purchases of public utility preferred stocks have been erratic, both as to dollar amount and as to percentage of total preferred stocks offered. Such purchases by life insurance companies amounted to only $38,000,000 or 20.5 per cent of the total offered in 1948. They jumped to $178,000,000 or 43 per cent in 1950, dropped sharply to $48,000,000 or 17 per cent in 1951, but recovered to $94,000,000 or 26.5 per cent of the total offered in 1953.

It is interesting to note the wide variation in holdings of public utility preferred stocks on December 31, 1953, by the largest U. S. life insurance companies. (See table on next page.)

The preferred stocks of electric utilities should be an outlet for a much higher percentage of life insurance funds because:

1. Compared with bonds, they usually provide a yield between 100 and 125 basis points higher than

		Total Assets (Billions of Dollars)	Public Utility Preferreds (Per Cent of Total Assets)
Metropolitan Life	(largest)	$12.3	0.4
Prudential	(2nd in size)	10.9	0.3
Equitable Life	(3rd in size)	7.0	1.2
New York Life	(4th in size)	5.5	1.9
John Hancock	(5th in size)	3.8	0.7

the first mortgage bonds of the same company.

2. The yield after income taxes on a preferred stock to a life insurance company is approximately 25 basis points higher than with a bond providing the same pretax income.

If this is true, why don't life insurance companies hold more public utility preferred stocks? In my opinion, this is due to the fact that:

1. Life insurance companies in the United States and Canada are required to value all stocks at year-end market values for statement purposes; and
2. The market action of public utility preferred stocks has been notoriously poor since the record high prices reached in 1946.

Why has the market action been so poor? I believe this reflects:

1. The wide fluctuation in price which occurs in preferred stocks with any important change in the interest pattern because, unlike bonds, preferreds do not have a maturity date at par to cushion their decline; and
2. The thin market for public utility preferred stocks.

Why the Market Is Thin

Why is the market for utility preferred stocks so thin? This reflects:

1. The fact that most utilities, particularly in 1946 and 1947, were quick to refinance their preferreds with very low dividend-rate preferreds. As a result of the subsequent increase in interest rates, which was quickly reflected in lower preferred stock prices, both institutional and individual investors have heavy unrealized (or in some cases realized) losses, based on cost. In other words, "the burned child dreads the fire."
2. Electric utility companies make little effort to make their preferreds attractive to the investor. The most glaringly unattractive feature in present-day preferred stocks is the call prices. The call prices, typically, are too low. Furthermore, the declining call-price pattern, borrowed from bond call features to which they are not remotely related, unnecessarily narrows the list of buyers when a new issue is offered and does much to destroy the secondary market after the issue is outstanding.

Remedying the Situation

What can be done to remedy the position of electric utility preferred stocks? I suggest that future issues of preferreds carry a fixed call price of not less than five points above the offered price. That is, a call price that does not decline.

The life insurance industry has for some time been working with the regulatory authorities on a valuation formula for damping the swings in asset value of all preferred stocks. If this effort is successful, it should widen the institutional market for public utility preferred stocks.

Life insurance company purchases of public utility common stocks have been modest in amount. Following the qualification in 1951 of common stocks meeting certain tests as legal investments for life insurance companies incorporated under the laws of New York State, New York Life Insurance Co. became a purchaser of commons in that year. New York Life now owns more than $15,000,000 of public utility common stocks, representing about 28 per cent of our common stock portfolio.

Investment Appetite Varies

The investment appetite of different institutional investors often varies widely at a particular time. For example, New York Life did not have important institutional competition in purchasing public utility preferred stocks last year, but this has not been equally true this year.

On the other hand, New York Life has not been interested in purchasing low-yielding corporate bonds for some time. During this same period pension funds have been avid buyers of such securities. Also, some of the New England life insurance companies and one of the larger life insurance companies in New York City have bought moderate amounts of publicly offered lower yielding public utility bonds during the past year.

Incidentally, the willingness of some life insurance companies to make forward commitments, that is, to agree to advance money from time to time on fixed terms over a period of years, became a fairly important factor since the end of World War II and first became important in financing natural-gas pipelines. More recently, the forward commitment method was used in financing such major electric projects as Electric Energy, Inc., and Ohio Valley Electric Corp., as well as the plant expansion programs of long-established electric utility and industrial corporations. Forward commitments of life insurance companies are still at a high level.

The investment appetite of a particular institutional investor changes radically from time to time. For example, during the years 1947, 1948, and 1949 New York Life was the largest institutional buyer of public utility bonds in this country. This was, in large part, a switching operation from our large holding of U. S. government bonds bought during World War II. Our public utility bond purchases continued at a high level in 1950 but declined rapidly to a low of $29,000,000 in 1952 because better yields were obtainable on industrial obligations.

New York Life's Purchases

New York Life's purchases of public utility preferred stocks were at a high level in 1949 and 1950, at much lower levels in 1951 and 1952, at record high levels last year, and are continuing at a high level. As previously stated, New York Life began purchasing common stocks in 1951 and has continued such purchases at a low but increasing rate since that year.

The topics I have covered can be summarized in six points:

1. Life insurance companies as a group have been declining in importance as purchasers of public utility bonds. However, with the declining availability of satisfactory new indus-

trial loans and sooner or later a decline in mortgage lending, public utility bonds will probably be purchased in greater amounts by life insurance companies.

2. Pension funds are becoming increasingly important as purchasers of public utility bonds.

3. Life insurance companies as a group have been erratic purchasers of public utility preferreds. However, if more attractive call prices are provided for new issues and if insurance companies are allowed to reduce the fluctuations in asset value of preferreds by the regulatory authorities, life insurance companies should become much more important as preferred-stock buyers.

4. The income tax burden of life insurance companies will cause such companies to give increasing attention to the purchase of public utility preferred stocks.

5. Some life insurance companies, including New York Life, are purchasers of small amounts of public utility and other common stocks. I believe that the life insurance companies will became increasingly important purchasers of good common stocks whenever they provide attractive yields as compared with other types of securities.

Future Interest Rates

6. Future interest rates will move up as well as down depending on business conditions and employment in accordance with President Eisenhower's flexible monetary policy. It will not be a one-way street as was the case during much of the Roosevelt and Truman Administrations. Under such a flexible monetary policy, one would be reckless to make an unqualified forecast of future long-term interest rates for any extended future period. However, for the balance of this year I would expect such rates to fluctuate above and below present levels within a fairly narrow range. Over the longer term I do not anticipate any great scarcity of investment opportunities for institutional investors because of the huge sums that will be required to finance the further development and utilization of natural resources, to provide for the sharply expanding energy and other needs and desires of a growing population, and to provide an adequate defense. The rates at which funds will be borrowed will be influenced in an important way by the Federal monetary policy in effect at the time and can be expected to fluctuate from time to time.

STATEMENT BY MR. DRISCOLL:

A DISCUSSION of the outlook for capital from the institutional common stockholders' point of view seems to me an important assignment, because in the last four or five years professional common stockholders have become more numerous. You hear more about investment companies, pension funds, and trustees that buy common stocks. Life insurance companies are also now buying common stocks in greater amounts than ever before. It is probable that this trend towards institutional purchase of common stocks will continue.

The electric utility industry should realize that the men who handle this potential source of capital are professionals. They have the resources to analyze systematically the securities they purchase; and they carefully consider the relative values that are available in each type of security. Therefore, the electric utility industry ought to understand how the professional common stock buyer thinks and what generally impels him to action.

Before we get into that too far, I should like to make some general observations about the supply of funds for common stock investment. Unfortunately, there are no figures that I know of that are as accurate as those Mr. Martell gave on the source of bond funds. We can only guess at the amounts of equity capital available seeking investment. We do know, however, that the supply of these funds has been increasing. For instance, in my own industry, investment companies, the increase has been approximately $400,000,000 a year. I am told by those who have analyzed pension funds that the increase of common stock funds from pension funds has been about $500,000,000 a year. These are substantial sums, and yet they represent only part of the market.

Attitude of Professional Investors

It seems to me that as time goes on, professional investors will be inclined to put a greater percentage of their funds into common stocks. Very briefly and generally, that is based on three considerations. First of all, I think they all feel that to share in the growth of the country a common stock is the most suitable investment. Secondly, many professional investors believe that, over the long run, the purchasing power of money will decline. They know there is no perfect hedge against such a decline but that a common stock is probably the best hedge available to them. And thirdly, the professional investor realizes that he can benefit from growth in the internal value of a common stock through retention of earnings, and he wants to participate in that growth.

It seems to me that institutional purchases of common stocks have been and will be made for these reasons. This suggests that the supply of funds for common stock investment will be available in an increasing amount.

A Portfolio Manager's Viewpoint

The next question is, "How does the electric utility industry attract its share of that money?" To get at that problem, I would like to discuss how an investment manager selects securities. First of all, I wish to disqualify myself as an electric utility expert. What I will try to do is to describe the everyday problems of a portfolio manager.

A portfolio manager attempts to buy securities that will carry out an investment policy. Such policies vary widely among institutions. He buys individual stocks because he thinks they are attractive at the price he has to pay and because he is convinced of the company's ability to make profits and to pay dividends. He has made a study of the general investment characteristics of the company that enables him to set a price he is willing to pay for the company's earning power.

When a professional looks at earnings, he doesn't think in terms of what is going to happen for the rest of 1954. He looks at earnings under a lot of different conditions. What is the most this company can earn? On the other hand, what is the least it might earn under conditions of recession? Thirdly, what is the average earning power of this company likely to be over a period of three to five years? Under all these conditions, what dividend payments will this company make?

When he has made estimates of this type, he then must decide what he will pay for that earning power. Of course, any investor is willing to pay more for the earning power of a company that has substantial growth than

for one that has no growth. So, he studies growth, and then he studies stability of earning power. If you had a company that was making $5 a share this year and you were pretty sure it would report a deficit of $2 a share next year, you wouldn't pay much for this year's $5 earning power because you wouldn't have any sense of continuity of earning power. So the professional has to study stability of earning power.

Also he has to make an estimate of the risk of important change in the character of the business. When he has come to a conclusion about growth and stability of earning power and the risk involved, he can then apply a price-earnings ratio to his earnings estimate to determine high, low, and average values.

When you do that for many securities, industrials, rails, and utilities, some fairly obvious points come to mind. The range of fluctuation of earnings and dividends of utility companies generally is less than for industrials or rails. Normally, this relative stability of earnings and dividends would be reflected in more stable market action. As a result of this characteristic, a portfolio manager would not be a heavy buyer of utility stocks after severe decline in the stock market reflecting a major business recession. He might then feel that the recovery potential of industrials and rails was much greater than that of utilities.

On the other hand, after a long period of boom when industrial and rail stocks looked fully priced on his analyses, he might be more likely to buy utility stocks, judging that he would lose less there in the event of a decline than he would in industrials or rails. The foregoing is of course an over-simplification that omits many other factors that the investment manager must consider.

Flexibility of Industrial Stocks

He must also recognize that managements of industrial companies generally have more flexibility with respect to pricing policies. This ability to adjust prices and profit margins more rapidly than utility companies is an important characteristic that the investment manager has to recognize, especially in periods of rapidly changing commodity prices.

The recent action of the stock market presents a problem to the investment manager. After a sharp rise some industrials and rails have been under pressure, and confusion exists as to the outlook for business and stock prices generally. Under these circumstances, the investment manager is likely to favor utility securities.

From this discussion, which is by no means conclusive, I hope I have shown that the portfolio manager judges utility stocks in relation to other investment opportunities and that utility common stocks have to compete with other common stocks, as well as bonds, cash, and preferred stocks, for the investor manager's attention. A portfolio manager exerts every effort to invest in securities that are relatively the most attractive on a long-term basis. He is not inclined to be sentimental, and you may find him selling the securities of your company if their market price tends to outrun his evaluation of your company's prospects.

Applying General Principles

Now, think a little bit about these general principles and how they apply to public utility common stocks. Any professional, when he has his staff analyze a utility security, wants a broad knowledge of the nature of the company's business and of the economy of its service area. He wishes to study the service area carefully for clues to the company's future growth. Then he attempts to analyze the stability of earning power of the company, the division of revenues among residential, industrial, and commercial loads, and the importance of agriculture, heavy industry, commerce, and other types of business.

When he has done this, he makes a detailed analysis of the company's record, including the rate of increase in customers, unit sales, and dollar revenues. Further than that, he analyzes the degree of success in converting physical growth into higher earnings and higher dividends on the common stock—almost every professional investor regards that point as a test of management. It is true that the rate of return on electric utility stocks is regulated, but it does seem to the professional common stockholder that some of the physical growth that is recorded by your industry should trickle down to the benefit of the equity holder. More about that later.

After he has made an analysis of the company's record, he investigates rates, competition, regulation, and the impact of taxes. That is part of what I call a measurement of the risk in the security. I should like to make it clear that I am thinking of the risk of important change in the character of a company's business. Most people, when they talk about risk, are thinking of the vulnerability of earnings to a change in the level of business activity. This is not what I mean by risk. I define a risk as the probability of deviation in the actual market performance of the security analyzed from the performance indicated by the analysis of future earning power.

Fourteen Risks

The point here is that investment is an art; it is not a science. You have to allow for a margin of error. Every investment manager knows that he will make mistakes, and, therefore, his common stock purchases are based on analyses which indicate the probability of long-term capital gain.

To illustrate this point a little further, our Utility Department has prepared a list of 14 different kinds of risks that we find in various public utility stocks. Let me cite some of these risks to you:

We think there is a risk to the common stockholder if the company has a transit operation of importance to earnings. We also think there is a risk if there is a manufactured-gas department of importance to earnings.

Obviously there is a risk when large Federal power projects are in competition and there is a momentum from projects already started that concerns the equity investor.

There is a risk in a company that has relatively high rates because it may be vulnerable to a decrease in profit margin from rate reduction or a rise in costs that cannot be offset. And I might point out that in discussing high rates and high rate of return, which is another risk, investors are very much aware of the difference in attitude of state regulatory bodies throughout the country. We think that particularly lenient regulation represents a risk that there may be a change of government resulting in harsher treatment. We are apt to prefer enlightened or fair regulation rather than lenient regulation.

I am always asked how I interpret the term "fair regulation." Rather than attempting to define it in two or

three words, I hope the meaning of "fair" is clear from the total comments that I have made about the industry rather than from any one or two sentences. "Fair regulation," to the professional investor, would certainly demand long-term recognition of the rights of common stockholders to share tangibly in the electric industry's physical growth.

We think there is a risk in a company that has insufficient dividend coverage. Of course, everybody asks us, "What is a recommended percentage pay out of earnings for an electric utility company?" We don't like to answer the question. We try hard not to. But just to give a range to shoot at, we think that an electric company should pay out 70 to 80 per cent of its earnings. Obviously, the funds that the industry requires for expansion are so large that they can't be provided internally. If the company pays much more than 80 per cent of its earnings, the investor begins to question whether or not the company can maintain the dividend under adverse conditions, so that the company gets no benefit from the higher percentage. If it pays less than 70 per cent, the company will probably have to do its common financing at too low a price.

Unbalanced Capitalization

Going on with these risks, we find that an unbalanced capitalization impairing flexibility in financing is a risk. I don't have to remind anyone of the situation in the money market last year. Current refundings demonstrate the high interest costs experienced by companies that had to finance with bonds during the period of money stringency. For electric companies, we generally favor 65 to 70 per cent debt and preferred stock and 30 to 35 per cent common stock.

On this general subject of risks, the flexible financial policy of the government with respect to money rates bothers us as common stockholders from time to time. It seems to us that the demand for capital is high. While funds are available at the moment at a low interest rate, things could happen to the economy that might change that situation very rapidly, for instance, becoming more heavily involved in Indo-China. There is a risk involved in that situation at the moment.

We think there are risks involved when large amounts of convertible securities are outstanding, when earnings are subject to material change through variations in hydro-generation, when there is dependence upon one or two crops or industrial customers, when there exists a poor history of relations with regulatory authorities, public or labor, when a stock has poor marketability, and, finally, when service area is subject to drought, flood or windstorm.

Outlook for Common Stocks

I discuss these and emphasize them largely because I want to stress that there is a risk to owning common stock, and, to offset the risk, the common stockholder demands some opportunity to benefit from the growth that occurs in the industry.

I should like to summarize by presenting our picture of the present outlook for electric light and power common stocks. We think earnings trends generally are favorable. The money market is receptive to new financing. Utilities are operating in an atmosphere of greater confidence with respect to regulation than for quite some time in the past. We see no immediate prospect of great commodity price inflation, which we think is favorable to the industry. The only problem we see is that the market prices of utility stocks, in our judgment, to an important extent reflect the favorable outlook. A somewhat superficial indication of this is found in the fact that returns on utility stocks today are less attractive in relation to the rest of the market than they have been during most of the past two or three years.

STATEMENT BY MR. SCHLOSSER:

GENERALLY stated, I think that our best intelligence and best analysis as to the present-day outlook for capital markets are favorable, and I am inclined to concur generally with the views that my colleagues have expressed. So far as the money market is concerned (the bond market, the likely trend of interest rates) we see the likelihood of little change in present levels, either up or down. Such markets are seldom static in a free economy, and it is normal and proper that there should be some modest fluctuation. As best we can analyze it, we think that the supplies of investment capital likely to be available, at least during the remainder of this year, to the public utility industry and to other industry, and to local government revenue ventures, are likely to be in reasonably good balance with the demand for such investment capital.

We think the bond market is on a favorable level so far as money costs are concerned. We know of no reason why public utilities or other industries having current need for such funds should hesitate to enter those markets contemporaneously.

We think we are enjoying an exceptionally good preferred market, as the market for preferred stock customarily goes. It is probably the least predictable and the most highly sensitive of all capital markets. Those of us who have been around for a little while are well aware of the fact that it may very well be here today and gone tomorrow, although in our view it is likely to represent a better market in the future than some in past history. Among other reasons, the market is broader today than it was in some prior periods by reason of changes in investment laws and other things that have brought substantial additional funds into that type of investment.

In our view, the stock market speaks for itself. It is at or near historically high level. Nobody but an unreconstructed cynic, in my view, could doubt that equity capital for public utilities is definitely, at today's level of the market, not only in ample supply but at very attractive rates for risk capital.

Markets Are Favorable

So, measured by the three principal markets for the issue of public utility securities, we think they are all highly favorable to the continuation of your construction programs and for financing in the normal course of business. We think it would represent good policy and sound policy, as and when you have need for money, to proceed to raise the kind of money that your individual capital structures at that time suggest as being appropriate.

That, of course, does not mean that markets are continuously favorable from day to day, and always the most favorable. Even in the very favorable markets we do have periods of upset and we do have periods of passing congestion. At the present time, I regret to say, we have a period of congestion in the bond market made up largely of undigested public utility securities. We don't think it is anything fundamental. We think that momentarily

the supply, perhaps, has gotten a little bit out of line with the immediate demand. We think that underwriters, perhaps including ourselves, have become temporarily a little bit too sanguine, and we will be very promptly and effectively cured of those mistakes. That is a characteristic of our business. We cure our mistakes, of necessity, quickly.

Summarizing that point of view, if I were running a public utility business and were expanding and had new capital requirements, I would proceed to raise them as I could digest the capital. And I would not speculate on future markets because present markets, in my view, are favorable for all major classes of capital.

Strong Equities

I think that the present is a good time for the public utility industry to strengthen and maintain a strong equity position. I think that for several reasons. Historically, it has always proved to be true that periods of great prosperity and periods of free supply in the capital markets are good times in which to put one's house in order financially and to make it as nearly impregnable as possible to the uncertainties of the future. Inevitably following this period there will come a day when economic conditions will not be as sanguine as those which we presently enjoy.

I know there is not unanimity of opinion among all financial analysts and others about strong equities, and I can only present my own point of view. There is, of course, a great temptation under existing tax laws to try to avail oneself, to the fullest, of the leverage advantages and the tax cushion of borrowed money as against permanent equity capital. You can do the arithmetic as well or better than I. The figures, at their face values, are somewhat startling, but they should not be taken too literally, I think.

Sound policy and sound management are inescapably linked with the maintenance of a continuingly strong and sound financial position. There is also the point, sometimes overlooked in casual analysis, that a very basic ingredient of good credit is a strong equity. It is much easier to deteriorate, if not destroy, good credit than it is to build it up. There is the further important point that the investment rank, acceptability, and price level of your junior securities, preferred and common stocks, will be directly affected by the quality and strength of your bond credit standing.

So, we strongly recommend this as being a good time in which to build up and to maintain strong equities, especially in view of the fact that equity capital can be commanded today on such favorable terms.

High Selectivity

I am sure you could not have failed to recognize, after listening to Mr. Driscoll, that at least professional investors—and they are growing in number and in importance—and to a lesser extent smaller investors, are practicing today that which is traditional in a period in which the economy may be going through a transition to, let us say, a more intensely competitive level. That is the growing tendency, the growing policy, to be highly selective and highly discriminating in making risk investments. We know from our experience that that applies no less to the habits of investors toward public utility equities than it does toward other types of securities and will undoubtedly continue for some time. It has been going on progressively for some time.

In utilities, Mr. Driscoll has summarized points that his firm endeavors to examine with great care. But, broadly stated, I think the thing to bear in mind is the fact that even the most conservative investor who looks to good utility equities for long-term dependable income has in the back of his head, decided that he wants to buy something more than a good annuity. Growth is a great magnet to attract investment capital, and it is one of the reasons why investment capital has been attracted to the public utility industry in such very large volume over this postwar period and continues to be so attracted.

But, investors are essentially cold-nosed, realistic people, and when we talk in terms of the attraction of growth, we mean, of necessity, something more than merely the romance of growth. We mean also the growth of earnings that are either paid out or plowed back in appropriate proportions and represent an increment and a potential capital gain of some sort.

Continuous Competition

There is no use blinding oneself to the fact that the public utility industry is continuously in competition with all other industries and some powerful governmental tax-exempt units showing very handsome yields whenever they seek capital, and that the public utilities are going to be judged in comparison, and strictly on a comparative basis, with other industries and government units. Inevitably funds will flow in the greatest volume and with the greatest confidence in the directions that promise the most satisfactory rewards.

Now, I would not presume to attempt to tell informed utility management, nor would I attempt to presume to tell public officials, about their statutory duties in respect to what constitutes fair and attractive earnings to a public utility company to enable it to compete advantageously for capital. Those are your problems and those of your regulatory bodies singularly rather than of the investment banking industry. But the fact remains that you must not only maintain earnings but also a promise of a continued growth in earnings comparable to that which your competitors can present in the open market, if you wish your share of available investment funds on terms that are relatively as attractive as they are made available to competitive industries.

Promoting Securities

I want to go over briefly some things public utilities can do to promote the popularity of their securities. I think that management in the public utility industry has been exceptionally alert and effective in what it has been doing and continues to do. I think it ranks among the highest in corporation management in the completeness with which it reports information about its affairs, the frankness with which it is prepared at all times to answer legitimate inquiries, and the manner in which is has taxed its personal time and facilities to make itself available to investment communities, at forums and before analyst societies and the like, to keep the professional public informed concerning industry affairs. I think utility management has done not only a good job but a job that is going to pay dividends for many years to come.

In the flotation of new capital offerings and especially of equity offerings, I think the practice of availing yourselves of facilities through the investment banker of your choice to organ-

ize meetings and other methods of education, and to disseminate pertinent material to the investing public, has contributed toward the favorable reception your securities more often than not have commanded and the levels at which they have continued to sell.

There are some things in which I think you have been perhaps shortsighted by your own choice or by the pressure of regulation. I recommend particularly that you consider carefully the remarks Mr. Martell made about call prices on preferred stocks. I do not mean by that to offer an unqualified endorsement of the formula he suggested. I don't pretend to know, at least off the top of my head, whether that is the magic formula that will satisfy the most people or not.

But I do think that the public utility industry, for one reason or another, has been a little shortsighted in the degree to which it has attempted to "skin the cat" in the call prices it has attached to the securities offered to institutions and other investors generally. I won't say it has been consciously unfair, but I think it has been unfair and that you have been presented with an unnecessary hurdle to a broader reception and a broader market for some classes of securities that you want to sell.

In degree, I think I might make the same kind of comments about the rather skinny call prices you are customarily in the habit of attaching to your bond issues. I think that you would make money by using a pencil not quite as sharply when you compute your proposed call schedules.

I suppose no investment banker sitting on this forum would be considered wholly frank unless he had something to say about that hardy perennial of your industry and ours, competitive bidding. It is not my intention to belabor the subject nor to burden you with a lot of theory or violently partisan argument. Quite on the contrary, I personally hope very earnestly that we are entering an era in which that too much debated topic may be treated with somewhat more light and a little less heat, a little more intelligence and perhaps a little less ideology.

We have no quarrel with competitive bidding as one of the means appropriate in some circumstances for the favorable sale of some types of public utility securities. We are realists, and we know that competitive bidding as a mechanism is probably here to stay in one degree or another for the predictable future, and that is all right with us.

Two Things Wrong

What we think has been wrong in the past, and what we think is wrong in some substantial measure today, really consists of two things. First, we think that compulsory competitive bidding is a kind of straitjacket; and we do not see virtue in any kind of a straitjacket. Secondly, we think that to the degree—I say this advisedly and hope nobody will take offense—that some public utility managements may have pursued a practice of automatically putting their securities up for competitive bidding for convenience or to shirk the responsibility of making a management decision themselves, they are ill-advised in doing so.

We regard competitive bidding, as a practice, as being merely one of numerous ways that are open to any independent management to raise capital. We think it is probably the duty of management, in contemplating a capital flotation, to look at that means as well as the various other means that are available to it, and make an independent determination as part of its management function as to that method which at the time seems best suited to both the immediate and the long-term policy objectives of the corporation.

We think that regulatory bodies have a duty to recognize that management does have that responsibility. We think that when management demonstrates diligence to its regulatory body in arriving at a business decision upon an informed basis, it ought to have a right of choice precisely as it is customarily granted that kind of right in connection with the other major aspects of the conduct of a public utility business—building power plants, public relations, and all of the other assorted things with which management is charged as part of its duty.

We think all of you who have had experience over the postwar years in the issuance and sale of securities know perfectly well that no one method of issuance, least of all, in our opinion, competitive bidding, has a monopoly on virtue. We recommend that you use your own judgment. We recommend that you seek expert advice, if you think you lack expert judgment, and then make up your own minds and proceed to use that method which, in the circumstances, seems best suited. You will find co-operation and not criticism from investment bankers.

Companies Urged to Order Jubilee Materials Early

A SAMPLE packet of Light's Diamond Jubilee materials was recently distributed to companies participating in the Jubilee. Included in the packet were stickers, pass-out literature, a brochure picturing Jubilee photograph sets, a streamer, a copy of "The Genie in the Amber Box," and a catalog listing all Jubilee materials prepared before June 1.

The handsome Jubilee medallion was also included, along with the scripts of two television spots and a synopsis of the Jubilee film, "The Eager Minds." The film is now in its final production stages and will be completed on August 1. Processing of the spots will begin about that date.

A special showing of the "rough cut" of the film, with the commentary and music "interlocked" to it, was given the Program Committee two weeks ago. Committee members were enthusiastic about it, feeling that the picture would be effective not only in the promotion of electrical living but also for the promotion of careers in the electrical industry.

The letter accompanying the packet urged that Jubilee materials be ordered as soon as possible. There are two reasons for this in the case of the film. Production schedules are tight at the movie laboratory, and orders must be in by August 1 to insure August delivery. Also, orders placed before this date will benefit from a quantity discount made possible by the processing of a large number of prints at one time.

The letter pointed out that only a few weeks remain until the climax of the Jubilee on October 21. So, to make the fullest use of all Jubilee materials, they should be obtained quickly.

Rates and Securities Regulation by the Federal Power Commission

Jerome K. Kuykendall
Chairman, Federal Power Commission

An address before the 22nd Annual EEI Convention, Atlantic City, N. J., June 3, 1954

THE electric industry is of first importance to our economy and to our national defense. It has immeasurably improved our standard of living, and it has made life easier by removing many burdens from men's and women's backs. I rejoice with the industry in celebrating the 75th anniversary of Thomas Edison's invention of the electric light bulb.

By nature, the electric utility industry is a public calling. It needs special governmental privileges, grants, and immunities, and requires regulation by governmental authority in the protection of the whole public interest. By law, electricity is for sale in Atlantic City by one and only one business institution. That would be an intolerable situation for most businesses—the butcher, the baker, the candlestick maker—but it is altogether sound for the electric utility business, provided, of course, that such business is not given the complete freedom of decision so necessary to the proper functioning of our competitive system, but instead is subject to adequate regulation by the people through their constituted governments. The Federal and State governments have provided the means of doing this regulatory job.

Still Must Think Out Answers

With all the technological advancements in the electric utility field, however, we have not reached the stage where all we have to do is push a button to get the correct answers to our regulatory problems. In this legal-economic-social area, we still have to search for the answers the hard way, by thinking them out—aided and assisted, but not always expedited—by debate.

The early attempts in this country to regulate utility rates was through direct action by legislatures. Many statutes were enacted after the war between the states, fixing railroad rates, generally on the basis of so much per passenger mile. Regulation through the franchise was also tried,

JEROME K. KUYKENDALL

but this method, while still used occasionally, did not provide the means of obtaining the desired result.

From a small beginning in the last half of the Eighteenth Century, there developed, particularly during the first 25 years or so in the current century, the commission form of regulation. When I think of the size of your industry—with total assets of some $25,000,000,000, and when I ponder the complex regulatory problems in this complicated economic age, I have no difficulty in concluding that rate regulation by the direct legislative process or by the inflexible franchise has no place in the modern scheme of things. The task calls for specialization. It calls for an impartial agency, adequately staffed by experts, which is the theory, perhaps not always realized in practice, of our modern public utility commission.

Aims and Responsibilities

One of the primary aims of utility management is to secure what it considers to be adequate revenues; one of the main responsibilities of commissions is to see that the rates according to which the revenues are collected are just and reasonable. Unjust, unreasonable and unduly discriminatory rates are generally prohibited by law. In the field of rate making one would not expect the views of the utility, the consumer, and the regulatory commission exactly to coincide. As a matter of fact, in this field we frequently find wide differences of opinion, not only as to the rates themselves, but also as to the standards to be employed in determining them.

In my opinion, standards for determining the level of rates for utility service are absolutely necessary if a competent regulatory job is to be done. This would now seem a truism, but it has not always been so.

Two years before Edison invented the electric light bulb, the Supreme Court of the United States handed down a decision, which, I believe, was the first one in the field of public utility rate regulation. In Munn v. Illinois 94 U. S. 113 (1877), the Court held that rate-making was entirely a legislative process which was not reviewable by the courts. I am sure that all electric industry leaders have heard many times the oft-quoted statement of the court in that case, "For protection against abuses by legislatures the people must resort to the polls, not the courts."

Munn Case Decision Reversed

By degrees, however, the Supreme Court departed from this holding that no standards of rate-making were required as a constitutional test of reasonableness. Finally, in 1898, the Court effectively reversed its holding in the Munn case and held that rates must be fixed so as to yield a fair return on the fair value of the properties used and useful in the public service.[1] Thus in 1898 a judicial standard—fair-value rate base—emerged. I would like to emphasize that this was a judicial as distinguished from a legislative standard. It was based upon legal, rather than economic or social, reasoning. It

[1] Smyth v. Ames 169 U. S. 466.

was rooted deeply, by analogy, in the law of eminent domain.

The fair value principle was tried for close to 40 years. But during this period it was far from free of criticism. In the 1920's, when regulation by commissions had become widespread, it came under a heavy barrage of attack. The Supreme Court itself, beginning in 1923, when it decided the Southwestern Bell case[2] was divided on the question as to whether the fair-value base was a constitutional requirement.

The Committee on Progress in Public Utility Regulation of the National Association of Railroad and Utilities Commissioners in 1941 said, "The entire (fair-value) procedure has been criticized more than it has been defended."[3]

The Rate Base

Those parts of the Federal Power Act which give the Federal Power Commission jurisdiction over wholesale interstate rates of electric utilities became law in 1935. The Natural Gas Act, which is also administered by the Commission, was enacted in 1938. These acts, which are practically the same as to rate-making standards, do not require rates to be fixed with reference to a fair-value rate base. In the leading case of Federal Power Commission v. Hope Natural Gas Company, 320 U. S. 59, decided in January 1944, the Supreme Court held that the fair-value rate base was no longer required as a matter of constitutional law.

Since the decision in the Hope case, regulatory commissions have shown by a great preponderance of opinion that they favor the investment (sometimes called the "prudent investment," "net investment," or "original cost") rate base. It is true that some state commissions which have attempted to use the investment base have been enjoined by the courts on local statutory grounds. These decisions were based on statutory law, however, and not constitutional requirements.

A study now in progress by the Federal Power Commission indicates that the investment method of evaluating utility facilities to determine the rate base is used by about 32 out of 49 commissions responding to a questionnaire. In addition, some of the commissions which purport to use the fair-value base appear to treat fair value as synonymous with investment, and a few others make only a relatively minor adjustment to cost figures in reaching the value base. I believe it can reasonably be said, therefore, that in the last decade the investment rate base has greatly predominated in the determination of just and reasonable rates for public utility service. It might be noted that this, generally speaking, has been a period of high prices when fair value would quite naturally be expected to exceed net investment.

Thus we have had a reasonable test of the investment principle. What has that test shown?

First, the electric utility industry has enjoyed its greatest expansion during this period. Thus, at the end of 1943, utility plant of all Class A and Class B companies stood at $14,800,000,000; at the end of 1952, the last year for which we have the figures, such utility plant amounted to $25,700,000,000.

Revenues, Dividends Increased

Operating revenues of electric utilities increased from $3,400,000,000 to $6,500,000,000 during the same period.

Common stock dividends increased from $285,000,000 in 1943 to $595,000,000 in 1952. Surplus increased in this period from $1,000,000,000 to $2,100,000,000.

The natural gas industry likewise enjoyed unprecedented expansion from 1943 to 1952. During this period the Federal Power Commission issued certificates of public convenience and necessity authorizing approximately 55,000 miles of pipe lines and 4,000,000 hp of compressor station capacity. According to *Gas Facts*, a publication of the American Gas Association, natural gas revenues of utilities in 1943 amounted to $623,000,000, whereas in 1952 they amounted to $1,900,000,000.

The growth of the natural gas pipe line business has been phenomenal in the last decade. It is common knowledge that the Federal Power Commission uses the net investment rate base in its regulation of the rates of natural gas companies subject to its jurisdiction. In the recent decision in the Panhandle Eastern Pipe Line Company case, the Commission allowed the commodity value of gas produced by the company in lieu of cost of production. The Commission was careful to point out that this decision related to a problem peculiar to the production of a natural resource, and it strongly affirmed its position that the net investment base was altogether appropriate for normal public utility properties.

In the five-year period ended on December 31, 1953, the total new corporate financing in the United States amounted to $31,700,000,000 according to the *Commercial and Financial Chronicle*.[4] Utilities accounted for $14,600,000,000 or 46 per cent of the total. This is a splendid showing. It shows what we know to be a fact, that there has been no dearth of capital to finance the great expansion in utility facilities and services during this period.

Thus the record of the electric utility, and the natural gas pipe line business as well, has been an excellent one in the last decade or so. It was during this period that the investment rate base had its greatest recognition in actual practice. Its use in this period was widespread. The method has had an adequate test in a period of rather severe inflation. During this period electric utilities have prospered and their rates have been remarkably firm even under great inflationary pressures. In my opinion, the record shows that the investment rate base method has worked well.

Rates Standard Required

Accordingly, I come to these conclusions: (1) A reasonable standard for the determination of just and reasonable rates for utility service is required for the protection of the utility, its investors, its consumers, and the public generally, and (2) The most appropriate standard at this stage of the development of the regulatory art is a fair return on the net investment in properties used and useful in the public service, plus required working capital.

The second element in the rate standard is fair rate of return. The Federal Power Commission, in spite of many statements to the contrary, does not have a set rate of return. It considers all the relevant facts before reaching a conclusion in a given case.

Of course, students of regulation do not expect to find a wide band of rates of return allowed the large electric and gas utilities. In our recent natural

[2] Southwestern Bell Telephone Co. v. Public Service Commission 262 U. S. 276.

[3] National Association of Railroad and Utilities Commissioners, 53rd Annual Proceedings (1941), p. 370.

[4] May 10, 1954.

gas cases the rate of return we have found reasonable has ranged from 5½ per cent to 6¼ per cent. Because of the similarities of business, growth, and financing among these companies, I would not expect to find such differences in the financial facts and economic situations as would call for very wide variations. To reiterate, however, the Commission does not have a standard percentage as the fair rate of return in all cases, but makes its findings from the facts of record. In addition we must expect the rate of return to change with changes in financial and economic conditions.

The Commission has been criticized for allegedly paying too much attention to the cost of money in arriving at a fair rate of return. Cost of money, while not the exclusive measure of the rate of return, is certainly a necessary ingredient thereof. Obviously, no utility could prosper if it is not permitted to earn its reasonable cost of capital including fair amounts for the common equity.

There is nothing novel in emphasizing cost of capital in fixing the rate of return. This is made clear in a 1953 report of a committee of the Public Utility Section of the American Bar Association in which it is stated that "the cost of money continued to be a major factor in fixing rates of return. . . ."[5]

The rate of return is necessarily a judgment determination; the cost of money is not an exclusive test, but it must necessarily be considered in exercising judgment.

It is interesting to note the remarkable stability in electric utility income in the decade from 1943 to 1952. Expressed as a percentage of net investment, utility operating income of Class A and Class B companies amounted to 5.9 per cent in 1943, reached a high of 6.9 per cent in 1945 and 1946 and a low of 5.6 per cent in 1951. In the five years from 1948 to 1952, the percentage returns were: 6 per cent, 6.2 per cent, 6 per cent, 5.6 per cent, and 5.8 per cent respectively.

It is also interesting to note the earnings on common equity (common stock and surplus). For the years 1948 to 1952 respectively they were as follows: 9.9 per cent, 10.6 per cent, 10.6 per cent, 9.5 per cent, and 10.2 per cent. These earnings were not only stable, but also were, I believe, at a reasonable level.

The Federal Power Commission has limited jurisdiction over the security issues of electric utilities engaged in interstate commerce. The Commission's authority does not extend to a "utility organized and operating in a State under the laws of which its security issues are regulated by a State commission."

The Commission has a competitive rule with respect to security issues. It grants exemption from this rule only upon a genuine showing of good cause. I believe the rule has worked well.

In the last year it has come to the Commission's attention, that in certain negotiated sales, indentures restrict refunding for an unreasonable period or prohibit refunding unless the interest rate on the refunding issue is as high as the rate on the issue to be refunded. I believe these provisions are inimical to the public interest, and should not be approved. As far as I can learn, they are not included in indentures of securities sold under competitive bidding.

We have seen substantial changes in interest rates in the last year. Under these conditions it seems to me that the best way to secure a fair price for debt securities is through the competitive bidding procedure.

The electric utility industry as a whole is in a strong financial condition. It is doing a good job of rendering adequate service at what appears, again on the whole, to be reasonable rates. I am sure I speak for all regulators when I say we will do our utmost to keep it that way.

I congratulate the electric industry on its 75th birthday. I wish it, in the language of my calling, many happy years of adequate service at reasonable rates.

[5] Report of the Standing Committee to Survey and Report as to Developments During the Year in the Field of Public Utility Law 1953, p. x.

People Organized and in Action

(*Continued from page* 208)

area in preference to the other sections of the nation?

Any member of the Congress who continues to vote TVA funds—without providing that TVA pay its own way, pay taxes just like other utilities, and a reasonable rate of interest to the government for the funds actually devoted to the power business—is driving a nail in the industrial coffin of his own state.

You ask, "Will Arkansas' progress keep up? Will these efforts slow down? Don't your people get tired, promise to do lots of things and then fall down on them?"

We don't know for sure. But it mainly depends upon our leadership. It's just a matter of inspiring top management.

This is a job you have to do yourselves; you can't send an assistant; you can't hire it done. You have to make up your mind that your business cannot be any more prosperous than the territory you serve. Your revenues will be measured by the prosperity of your customers. You build your people, and the people will build your business.

I am reminded of a story of Thomas Jefferson. He wrote his own epitaph and gave it to his daughter, Martha Randolph, just two days before his death. He said he did not want one word changed.

The epitaph reads: "Here is buried Thomas Jefferson, Author of The Declaration of Independence, Author of the Virginia Statute for Religious Freedom, and the Father of the University of Virginia."

Jefferson had been a member of Congress, Governor of his state, minister to France, Secretary of State, and Vice President and President of his country. He did not mention any of these honors and he told his daughter why. Here is what he said: "The things in this epitaph are the things I did for the people. The other things not mentioned are the things my people did for me."

I have tried in my simple and humble way to challenge the high citizenship and the deep patriotism of the electric industry. The people of America look up to it. They have great faith in it. They have a right to expect much from it.

The electric industry is the greatest industry in this nation. In it are the natural dreamers and builders and leaders of the country. As they think and go and grow, and as they have vision and faith and courage, they will light the pathway of civilization for a thousand years to come.

Industrial Relations Conference Program

Fred R. Rauch

Vice President, The Cincinnati Gas & Electric Company, and Chairman, EEI Industrial Relations Committee

THE Eighth Round-Table Conference of the EEI Industrial Relations Committee will be held at the Palmer House, Chicago, Ill., on September 27-29, inclusive. The program, drawn up by Chairman D. A. Bartlett of Western Massachusetts Electric Co. and his subcommittee, has been patterned after those of previous conferences and is perhaps more comprehensive, with the introduction of a new idea in role playing. The steady growth in attendance at the conference during past years indicates that at least 250 industrial relations and operating executives will attend.

Luncheon Speakers

A prominent utility executive will speak at the first luncheon meeting on Monday, September 27. He will talk on "Light's Diamond Jubilee." Since people are the general theme of this conference, in addition to discussing the technical and economic problems of the industry in the past and future, he will also discuss the part played by people in solving their problems.

R. C. Simpson, Manager of the Industrial Relations Department, Gilbert Associates, will talk on "The Employee Looks at Management" at the Tuesday luncheon. Allen King, President of Northern States Power Co. (Minn.), will speak at the Wednesday luncheon on "Management Looks at the Employees." Mr. Simpson will outline employee criticisms of management, as well as what employees expect of management. Mr. King will cover the other side of the coin, discussing what management expects of employees and their shortcomings as management sees them.

As was the practice last year, the four principal topics for discussion at the conference will be presented by four utility executives whose broad experience qualifies them to lay the basic groundwork for the "bread-and-butter" round-table sessions to be held on the remaining two days of the meeting.

J. P. Flemming, General Supervisor of Personnel Services, The Cleveland Electric Illuminating Co., will talk on "Motivation of Employees' Behavior." From his many years' experience in consulting and training, he will point out requisites for employee motivation, where it comes from, and how to channel it. The effects of general policy as well as personal treatment on the employee will be discussed. Lastly, Mr. Flemming will consider the problem of recognition of these various motivating forces and their proper development.

T. G. Ayers, Vice President of Commonwealth Edison Co., will discuss "Employee Relations in the Retirement Area." He will review and challenge pre-retirement counseling and similar steps preparatory to retirement. Financial aspects, pension problems, etc., are among the problems to be considered. The communication angles of these problems and relations with retired employees will also be considered by Mr. Ayers.

"The Collective Bargaining Aspects of Manpower Management" will be reviewed by E. J. Brill, Director of Employee Relations, Pennsylvania Power & Light Co. The industry's changing technological improvements demand that a closer look be taken at collective bargaining agreements so that they do not preclude management's taking full advantage of these improvements. Also, unions must be willing and intelligent participants in effectuating these changes.

"The Role of Personnel Administration in Management" is a particular interest of J. S. Gracy, Vice President,

Speakers and Conference Leaders

Luncheons

ROBERT C. SIMPSON, Manager, Industrial Relations Department, Gilbert Associates.
ALLEN S. KING, President, Northern States Power Co. (Minn.).
FRED R. RAUCH, Vice President, The Cincinnati Gas & Electric Co.

General Meeting

T. G. AYERS, Vice President, Commonwealth Edison Co.
E. J. BRILL, Director of Employee Relations, Pennsylvania Power & Light Co.
J. P. FLEMMING, General Supervisor of Personnel Services, The Cleveland Electric Illuminating Co.
J. S. GRACY, Vice President, Florida Power Corp.

Motivation of Employees' Behavior

J. J. FOLEY, Personnel Counsel, New England Power Service Co.
J. E. KANE, Assistant Manager, Personnel Department, Consolidated Gas Electric Light and Power Co. of Baltimore.
S. F. LEAHY, Manager of Employee Relations, The Detroit Edison Co.
W. H. SENYARD, Director of Personnel, Louisiana Power & Light Co.

Employee Relations in the Retirement Area

K. K. ALLEN, Manager of Industrial Relations, Southern California Edison Co.
H. L. DURGIN, Executive Vice President, Central Vermont Public Service Co.
R. E. PHENICIE, Personnel Assistant, Wisconsin Public Service Co.
O. H. RIRIE, Industrial Relations Manager, Utah Power & Light Co.

Collective Bargaining Aspects of Manpower Management

D. C. ALLEN, Assistant Industrial Relations Manager, Public Service Electric and Gas Co.
C. H. CAMPBELL, Personnel Director, Pacific Power & Light Co.
H. N. HENRY, Vice President, Alabama Power Co.
C. R. STOCKHUS, Supervisor, Employee Relations and Planning Department, Union Electric Co. of Missouri.

The Role of Personnel Administration in Management

V. C. BRENNAN, Executive Director of Personnel, Union Electric Co. of Missouri.
J. K. DAVIS, Vice President, The Toledo Edison Co.
F. L. LARKIN, Vice President, Wisconsin Electric Power Co.
W. F. MOSES, Vice President, New Jersey Power & Light Co.

A Grievance Subject

D. A. BARTLETT, Director of Industrial Relations, Western Massachusetts Electric Co.
H. L. DURGIN, Executive Vice President, Central Vermont Public Service Co.
M. F. OSTERLING, Director of Personnel, The Hartford Electric Light Co.
J. E. TEAGAN, Labor Relations Counsel, New England Power Service Co.

Florida Power Corp. He will present his ideas on the functions of the Personnel Department. Starting with the appraisal of its needs, Mr. Gracy will show that this department must be geared to these needs rather than any preconceived idea of a program. Eternal vigilance for changing conditions is Mr. Gracy's basic advice for personnel departments.

Two new features have been added by the subcommittee. On Tuesday evening, a team of New England personnel men will act out a grievance procedure. M. F. Osterling of The Hartford Electric Light Co. will be the Aggrieved Employee; John Teagen of New England Power Service Co., the Business Agent; Harold Durgin of Central Vermont Public Service Co., the Foreman; and Mr. Bartlett, the Personnel Director.

Another innovation will be an exhibit of company personnel publications. A display of various types of company pamphlets, brochures, magazines, etc., accenting primarily the four conference topics will be open each day of the conference.

In order to provide that important ingredient of the conference—know your neighbor—the subcommittee is repeating the usual Hospitality Hour on Monday night.

Monday afternoon, all day Tuesday, and Wednesday morning, the conference will be broken up into small groups as it has been in the past. Each group will have opportunity to interchange ideas. The group composition, as before, will reflect all levels of experience represented, as well as geographical composition.

The groups will discuss for a half day each of the conference's four principle topics, the philosophy and fundamentals of which were presented Monday morning. These "bread-and-butter" sessions offer probably the finest possible media for exchange of experience and know-how. The younger men benefit by the experience of the men long in the field, while they in turn, have a chance to evaluate their own programs.

Attendance will be limited to the personnel and operating executives of privately owned electric and gas companies.

EEI Industrial Relations Committee To Meet

THE EEI Industrial Relations Committee will hold its July meeting jointly with the Personnel and Safety Section of the Northwest Electric Light and Power Association at the Multnomah Hotel, Portland, Ore., July 12-13. Fred R. Rauch, The Cincinnati Gas & Electric Co., Chairman of the Industrial Relations Committee, will divide presiding honors with Pat Holton, Utah Power & Light Co., Chairman of the Personnel Section. A. W. Trimble, Vice President of Pacific Power & Light Co. and President of the Association, will welcome visitors to the joint conference.

Three major subjects will be covered in panel fashion on three half-days, while the fourth half-day will be used as a clean-up session. The three subjects will be supervisory development, including selection, training, and evaluating performance; communications in the company, including economic education and person-to-person communication; and collective bargaining and contract administration.

Two luncheon sessions will complete the program, with Paul B. McKee, President of Pacific Power & Light Co., as the principal speaker at one, and W. Lloyd Vinson, Business Manager of I.B.E.W. No. 125 in Portland, as the other. Presiding at these luncheons will be R. C. Setterstrom, The Montana Power Co., Vice President of the Association, and Waldemar Seton, Vice President of Portland General Electric Co.

The accident prevention and safety supervisors of the Northwest companies, who form a part of the Personnel Section in that area, will hold their own session on Tuesday and participate in field trips and inspections on Wednesday, July 14.

Sightseeing trips to private company hydro developments near Portland, and to the Federal developments on the Columbia River, will also be available to other delegates on Wednesday, July 14. C. Herald Campbell, Pacific Power & Light Co., and Russell James, Portland General Electric Co., are co-chairmen of arrangements.

Preference Clause

(*Continued from page* 212)

due to tax freedom and inadequate cost allocations is the motivating force in the hands of those professional champions of preferences and public ownership whose ultimate target is a socialized power system. The antidote to this is fair play in taxes and elimination of subsidies.

On the positive side, since all citizens stand equal under our government, fair play again calls for an allocation of available power from Federal projects without discrimination and at compensatory prices in proportion to the number of rural, residential, and retail commercial customers served by each applicant. Rates charged by the distributors subject to state and local regulation will be fair and the cry of "unconscionable profits" we know is "hogwash."

Eliminate Injustice

For the sake of all the taxpayers, not just those within the magic circle of preference clause, all power should be sold at market value or worth, all proceeds therefrom to be paid into the Federal treasury. If revenues thus produced are insufficient, the project will require an outright subsidy from other folks' taxes which should be disclosed to these taxpayers who have to pick up the check. In fairness and justice to all consumers, the preference clause as presently interpreted should be eliminated from Federal statutes so that there will be equal opportunity under law for American citizens everywhere in the nation to share in the benefits which may come from projects for which these citizens have to pay. This should be accomplished without discrimination as to availability, price, and contractural provisions.

To sum it all up, it is not our purpose to work hardship on any group of electric service customers, nor to suggest how they constitute themselves either as voluntary investor-owned companies or in some other form; what we do ask is that all customers in the United States receive equal treatment under the law. The rights of citizens and taxpayers should not be adjudged to be deficient because they elect to do business under the free enterprise system instead of by use of tax-favored or government-subsidized organizational mechanisms.

Electrical Equipment Committee Meeting

A. M. deBellis, *Chairman*

THE Electrical Equipment Committee held its 63rd meeting at the Edgewater Beach Hotel in Chicago, Ill., on May 3-4, 1954, with an attendance of approximately 80 members and guests. On Sunday, May 2, committee members were guests of the Commonwealth Edison Co. on an inspection tour of the Ridgeland Plant.

Papers, Reports, Discussions

The program consisted of the presentation of papers and reports and discussions under the sponsorship of D. W. Taylor, Chairman of the System and Apparatus Troubles Division; C. C. Farrell, Chairman of the Apparatus and Design Division; R. G. Meyerand and G. M. Tatum of the System Engineering Division; G. L. Derrick, Chairman of the Operation and Maintenance Division; and R. J. Hirsch of the Foreign Practice Division. In accordance with its regular procedure, the committee devoted most of the first day to a closed meeting for informal discussion of apparatus troubles and other appropriate subjects. The afternoon session was held jointly with the Prime Movers Committee.

R. M. Pennypacker reported he, as liaison representative from the Electrical Equipment Committee, had attended a meeting of the Insurance Committee at which several series of tests on fire protection installations had been described. Of particular interest was the extent of a fixed water spray system in one case which included power transformers, oil reservoirs, oil handling equipment, hydrogen equipment, and the principal points in the coal handling system.

R. J. Hirsch of Shawinigan Water and Power Co. presented the report of the Foreign Practice Division. An illustrated description of the 301-kv oil-filled cable installed at the Kemano Power House of the Aluminum Co., Ltd., at British Columbia was given. This cable is unique since almost all the metal used is aluminum, including the conductors and cable sheath. Mr. Hirsch pointed out that as far as he knew it is the highest voltage cable used for actual power transmission.

After the roll call Chairman deBellis announced that B. Van Ness, Jr., was resigning from the committee. R. W. Wilbraham then spoke briefly about Mr. Van Ness, who was presented with a scroll in recognition of his service to the committee.

Under sponsorship of the System Planning Division, G. F. Switzer described system planning as practiced by the Indianapolis Power & Light Co. He pointed out that the constant pressure on the electric utility industry to supply power for rapidly increasing loads and at the same time improve voltage and continuity of service, all at little or no increase in cost per kilowatthour to the customer, requires that both long- and short-range planning be utilized to the fullest extent. Long-range planning is required for establishing a broad pattern for system growth, while short-range planning is needed for comparing economic alternatives, the scheduling of work and equipment, and budgeting. The three major items to be considered in long-range system planning are voltage levels, sizes for units of equipment, and system patterns. Any long-range plan should be periodically reviewed and revised if it is to be effective.

Capability and Peaks

The service area of the Indianapolis Power & Light Co. is primarily the city of Indianapolis and all of Marion County. For the past six years an average of one new generating unit per year has been installed. These six units have a capability of 314 mw, bringing the present capability to 530 mw. Thus, 59 per cent of system generating capacity has been installed since the end of World War II. In the past, system peaks have occurred in the winter, but it is expected that because of the increased air-conditioning load future peaks will occur during the summer.

The compactness of the service area and the stiffness of the transmission and subtransmission systems have a number of economic and operating advantages. Because of this system stiffness industrial substations aggregating 154,000 kva of self-cooled capacity are operating without voltage regulation other than that provided by system regulation through the adjustment of generator fields. In addition to the generator fields, the principal other means of voltage regulation is the use of distribution bus voltage regulators.

Capacitors are installed on the system primarily to release system capacity and to reduce losses. Studies have indicated that in order to stay within the limits of steady state stability with conservative margins of reserve, the upper limits of system power factor are 92 to 93 per cent at peak load and 95 per cent at light load. Switched and unswitched capacitors have been installed but up to the present time installations of synchronous condensers have not been made.

Relay Protection

The second paper sponsored by the System Engineering Division was presented by R. W. Dearing and described relay protection as practiced on The Detroit Edison Co.'s extensive transmission system. Mr. Dearing explained in some detail the relaying practices employed by his company for the protection of the various components of the "bulk-power" portion of its electrical system, including five major thermal generating stations, five 120-kv interconnections with neighboring utilities, and suitable overhead and underground transmission facilities. The 120-kv transmission network has a solidly grounded neutral at the power plants, where the main generator step-up transformers are wye-grounded on the high voltage side. Additional grounding points of relatively higher impedance exist at points where regulating auto-transformers are placed, as at the stations where interconnections are made to neighboring utilities.

The policy of protection, developed through the years, is to provide not only "first-line" relaying equipments capable of quick and reliable isolation of any faulted component of the system, but also to provide one or more stages of "back-up" relaying. If the first-line relaying or circuit breakers adjacent to the faulted component fail

to isolate the fault, isolation will be accomplished by the furnishing of additional tripping indications to adjacent breakers. The implementation of this principle with respect to the "bulk-power" transmission system has been quite complete, with the idea that the company's general policy of providing the maximum reliability of service that can be justified by economic considerations can best be attained by protecting the system against such circumstances as instability or deleterious voltage regulation. To accomplish this the relaying systems have been predominantly "custom-built," and their forms are nearly as varied and numerous as the installations in which they appear. First-line relaying systems have been designed for the maximum reliability and completeness compatible with economics of prudent investment. Back-up relaying schemes have been devised with facilities already necessitated by other considerations in order to minimize incremental costs of applying them.

Control Circuit Isolation

Control circuit isolation is practiced by confining the d-c control wiring of each circuit breaker to its particular relay panel, benchboard or switchboard operating position, and its actuating mechanism housing. Interlocking and interconnecting schemes involving control of more than one breaker are, therefore, constructed by means of separate d-c auxiliary relay circuits or by routing the a-c secondary current and potential circuits to separate protective relays at each breaker panel position.

J. H. Foote reported briefly on revisions of American Standards for Power Circuit Breakers C-37 and recent activities of ASA Sectional Committee C-37. Mr. Foote also commented on the proposed new basis of rating power circuit breakers. He then distributed copies of a paper prepared by the AIEE Working Group on Circuit Breaker Rating Methods entitled "Should ASA Basis for Rating Power Circuit Breakers be Changed?" and which appeared in the May 3, 1954, issue of *Electrical World*. R. W. Wilbraham reported briefly on the recent activities of the EEI-AEIC-NEMA Joint Committee on Power Circuit Breakers. J. Q. Wray informed the group that progress was being made towards standardization of bushings.

C. E. Asbury reported on the recent meetings of the Subcommittee on Synchronous Machinery and the ASA C-50 Committee in New York. He said that a revision of ASA C-50 would be published early in the fall and would include conventionally cooled synchronous generators operating at elevated gas pressures. C. C. Farrell reported that NEMA had been approached as a result of action taken at the last Electrical Equipment Committee meeting regarding formation of a joint EEI-NEMA Committee on Transformer Noise.

At a joint luncheon on Tuesday, May 4, an illustrated talk entitled "Frontiers of Science" was given by Dr. C. G. Suits, Vice President of the General Electric Co.

R. G. Meyerand reported that the initial meeting of the System Planning Subcommittee on Monday, May 3, was devoted primarily to organization and development of a program of work.

Sponsored by S. C. Townsend of the Apparatus and Design Division, a paper describing new developments in high-voltage substation design was presented by W. B. Morton of the Pennsylvania Power & Light Co. PP&L's principal transmission voltages are 220 kv and 66 kv and all substation designs have been classified, so far as single-line diagrams are concerned, into types A, B, C, D, and E and the physical designs have been devised to fit these various standard diagram forms. PP&L has its own model shop and, under the supervision and guidance of engineers, models are made of all types and sizes of substations to obtain maximum benefits. Topographic models are used for locating structures and equipment on the site.

Standardized Substations

Mr. Morton described these standardized substations. Type A consists basically of a single 66-kv source and a single 12-kv line, although it may have 2 or 3 outgoing lines. The Type-B substation has two, three, or four 3-phase transformers arranged in two banks supplied from two 66-kv sources and which feed either two outgoing 12-kv lines or a 12-kv operating bus. Type-C substations are primarily switching centers for a limited number of 66-kv lines. The Type-D substation is used where high concentrations of load require large transformer capacity and where switching for several important lines must be provided. The Type-D substation is most representative of medium-sized substations on the PP&L system.

The 66-kv portion of the station provides an operating and an inspection bus with a single breaker connection to the operating bus and disconnect or air break connection to the inspection bus. Both operating and inspection buses are constructed of aluminum shapes suspended from suspension-type insulators and are cantilevered out from the main structure. The Type-E substation is representative of those where there are very large concentrations of power such as at major generating stations and major tie transmission stations. This type substation usually has complete double-breaker, double-bus design and may have switching both at 66 kv and 220 kv, usually with step-down transformer banks at 220 kv to 66 kv. For these large stations the 66-kv buses usually are a double-bus, double-breaker type of arrangement.

Substituted Steel for Copper

To reduce corrosion of underground pipes and structures due to dissimilar metals buried in the earth, PP&L in recent designs has eliminated copper and substituted steel for underground networks. The grounding network is a ½- by 2-in. steel bar with 3/16- by 3-in. taps to structures and equipment. All joints are welded and an inexpensive anodic protection scheme reduces corrosion of the network. The steel bar is not galvanized nor painted below grade. For taps coming up to structures, the portion at ground level is painted with bitumastic paint and the section extending above grade is galvanized for weather protection. Iron conduits between areas are used as tie conductors between ground networks.

The second paper sponsored by Mr. Townsend was presented jointly by J. F. Calhoun and J. J. Ray and described use of aluminum-welded bus structure in high-voltage substations by the Philadelphia Electric Co. Investigations showed aluminum buses to be both electrically and mechanically satisfactory with some cost advantage in favor of the aluminum. High-strength, heat-treated aluminum alloy (#63ST6) is used for bus conductors while all-aluminum

stranded cable is used for connections between disconnects and circuit breakers.

Messrs. Calhoun and Ray cited the following additional advantages in the use of welded aluminum over bolted copper: (a) reduction in design, ordering, expediting, and storage costs, due to reduction in quantity and variety of fittings; (b) practical eliminating of costly obsolescence of fittings resulting from necessary design changes; and (c) welded construction results in joints which are of greater permanency and electrically superior to bolted joints.

Hydraulic Power Committee Meeting

P. M. Hess, *Chairman*

WITH the Institute's other engineering committees, the Hydraulic Power Committee convened at the Edgewater Beach Hotel in Chicago May 4-5, 1954. Attended by more than 40 hydraulic power engineers, including many from major electric companies, the meeting was one of the largest ever held by the committee.

The two-day session was devoted primarily to papers describing design developments in hydro stations and operating experience with hydraulic power generating equipment. Interesting discussions followed each presentation.

Dam Studies with Soniscopes

A paper by A. C. Werden, Jr., described activities of the Southern California Edison Co. in investigating and compiling histories on dams by means of soniscopes. The soniscope is an instrument developed for the purpose of measuring non-destructively the deterioration of concrete and for exploring the depth and extent of cracking in mass concrete. Such determinations have long constituted an engineering problem, with the accuracy and economics of such measurements increasing in importance with the age of the structure under consideration. While this company had relied on testing concrete specimens taken by core drilling, the disadvantages associated with this method encouraged the trial of the soniscope. Results to date with this instrument have given rise to the conclusion that soniscope measurements will provide considerable information on the strength and rate of deterioration of concrete that will assist in effecting economical maintenance of dams.

A subject of particular interest to engineers responsible for maintaining concrete structures was discussed by P. M. Lefever in a paper concerning concrete problems on hydroelectric projects. Included in this presentation was a summary of the concrete repairs to the Susquehanna Electric Co.'s Conowingo Dam since its construction to the present time. Mr. Lefever pointed out that this company's policy is to provide preventative maintenance for concrete wherever possible. Experience has proven that waterproofing every exterior crack or joint that can be waterproofed will add years of life to concrete structures.

The use of fly ash as a substitute for some of the cement in the mass concrete of a 250,000-cu-yd dam structure was discussed by E. M. Fucik, Executive Vice President, Harza Engineering Co. The Guayabo hydroelectric project on the Lempa River in the north central section of the Republic of El Salvador, Central America, has been constructed of concrete with a fly ash content up to 25 per cent by weight. The decision to use fly ash as the pozzolan in this project was based primarily on considerations other than economy, and cost analyses proved that the fly ash actually cost more than would have an equivalent amount of cement. The fly ash used was mostly produced by steam power stations on the east coast of the United States, although over 750 tons from the State Line Power Station of Commonwealth Edison Co. were also used. This station has also been the source of much fly ash used in the Hungry Horse Dam of the U. S. Bureau of Reclamation.

Mr. Fucik expressed his company's belief that the use of fly ash on the Guayabo job was well justified. After one year, observations of the condition of the dam indicate that the concrete is remarkably free from cracking. It has been concluded that the use of fly ash reduced the temperature rise in the concrete after placing, resulting in this freedom from cracking. It is also believed that the fly ash increased the workability of the concrete, resulted in slower initial set, and insured against harmful alkali reactivity. An alternative to the use of the fly-ash pozzolan would have been to cool artificially the aggregates and mixture water. An investigation indicated that the cost of any type of cooling would have far exceeded the increased cost of fly ash over cement for this tropic location.

A. T. Larned and M. G. Salzman described an extensive research program that has been carried on since 1948 on the problem of water hammer in circulating water systems. During the past few years considerable attention has been directed to the problem of transient surge pressure phenomena in these systems, and the combination of vertical pumps, long conduits, and high siphon heads has often resulted in systems that require surge protection to insure safe operation. Based on these studies, it was concluded that certain modification to system layouts or pumps may serve to reduce possible water hammer to permissible values. In circulating water systems, vacuum breakers so located and adjusted to permit satisfactory normal operation, but prevent the formation of transient vacuous spaces, are the principle devices used to control water hammer.

Hydro Generator Design

Representatives of the Allis-Chalmers Manufacturing Co. described special features incorporated into modern hydroelectric generators and called attention to the fact that the majority of these features have been associated with the development of reversible pumped storage units. H. H. Roth, Application Engineer for that company, advised that generators for such applications must, in addition to meeting conventional requirements, (1) operate in either direction of rotation, (2) operate as synchronous motors as well as generators, and (3) operate (for some installations) at two different synchronous speeds—one for pumping and one for generating. Mr. Roth discussed details of equipment design based on these requirements. Although at the present time these special features are usually dictated by specific applications, future experience may make it desir-

able to incorporate some of them as standard items.

With the present trend in hydraulic turbine control favoring automatic operation, the problem of governing and remote actuation is of particular interest to hydraulic power engineers. On invitation from the chair, C. L. Avery, Woodward Governor Co., discussed recent developments in hydraulic turbine governing. Modern automaticity usually involves push-button starting and stopping either by remote manual control from the switchboard or supervisory control from another plant. Mr. Avery pointed out design features of hydraulic governing systems and described controls being used on the Bridge River, Kemano, and Cubatão installations.

B. B. Brown reviewed the history and development of the Virginia Electric and Power Co.'s Roanoke Rapids Power Station. Mr. Brown's discussion was illustrated with photographs showing various stages of construction at the 100,000-kw project.

Francis Turbine Runners

A highlight of the second day's session was a paper presented by R. H. Pepper, Newport News Shipbuilding and Dry Dock Co., on the nature of vibrations in Francis turbine runners. Laboratory experiments established the fact that trailing edges of runner blades do not vibrate independently, but that runners as a whole vibrate. Based on this finding, the Francis runner is characterized as a vibrating machine with several natural modes of vibration—all of which are easily excited by forces applied almost anywhere on the runner. The characteristics of some of these vibrations can be affected by slight alterations to the runner's trailing edges.

The Subcommittee on Hydraulic Turbine and Draft Tube Settings, under the chairmanship of E. B. Strowger, submitted a preliminary report. The purpose of the report was to review present practices on settings of reaction and propeller-type runners with respect to tail-water level and influence of the draft tube on the efficiency and economy of hydraulic turbine installations.

Mr. Strowger presented the report, pointing out the necessity of such a review, since present-day high-specific-speed runners require low settings with consequent deep excavations or long horizontal lengths to conform to turbine manufacturers' efforts to obtain high efficiency, while over-all plant economics including cost of construction, operation, and maintenance may indicate compromises on these requirements. The report summarized the various factors involved from a practical operating standpoint. The limiting dimensions prescribed by manufacturers were considered with the effect of variations on the efficiency of the unit. Available experience data on draft tube operation and effects of operation under various conditions were also discussed.

On Monday, May 3, Committee members and guests inspected the Allis-Chalmers Co. plant at Milwaukee.

Meter and Service Committee Meeting

C. V. Morey, *Chairman*

IN conjunction with the EEI Engineering Committee Conference held at the Edgewater Beach Hotel in Chicago, Ill., on May 3-5, 1954, forty-five members and guests attended the joint meeting of the EEI Meter and Service Committee and the AEIC Committee on Metering and Service Methods. The two-day meeting was devoted to reports and round-table discussions on metering problems of immediate interest.

A. W. Rauth presented a prepared paper on "Meter Obsolescence," bringing out the increasing importance of this problem to electric companies. He said primary consideration in this connection must be given to the inadequacy of 5-amp meters for present-day loads. Other reasons mentioned were physical deterioration, change in use, and changes in the art. Various considerations such as the annual depreciation and annual maintenance costs, among others, were reviewed in some detail. Considerable discussion of this subject developed following the presentation.

J. A. Morris presented a paper on the "Economics of Meter Testing." Three general test methods were mentioned, those of on-premise meter testing, change-for-shop test, and the Mobile-Meter-Shop method. Investment costs, testing methods and procedures, productivity, man-power requirements and the economic feasibility of the Mobile-Meter-Shop method were outlined. Photographs and various diagrams of wiring and shop layouts were submitted to round out the presentation.

A paper was presented by G. J. Yanda on "Metering Low Power Factor or Low Diversity Loads," involving equipment such as welders, X rays, and air conditioners. The need for an adequate means of metering these loads, which may have a duration of only a few cycles and/or a low power factor, was pointed out. The accuracy of present metering, the various means of accurate measurement of these loads, and the possible areas that might be explored in this connection were summarized.

H. A. Brown's paper on "Coordination of Service Drops, Meters, and Loads" cited the upward trend in residential consumption as reflecting the constantly increasing acceptance of new load-building devices and appliances, causing continued inadequate wiring conditions. The present need for 100-amp service capacity for residential use is becoming increasingly apparent. The possible use of higher service voltages and the increased use of large air-conditioning units were discussed from an economic viewpoint. It was concluded that over-all consideration indicates three-wire, 100-amp, single-phase service to be the most economical in the foreseeable future.

Metering Progress

A paper was also presented by F. A. Redding which covered "Progress in the Art of Electric Metering." He pointed out that meters of the early '20's, because of their commendable characteristics, were still performing adequately within their design capabilities. Engineering developments, however, have improved the overload range of meters to as much as 667 per cent in some present ratings. Other improvements have been made in temperature compensation, bearings, permanent magnets, terminals, and covers. Standardization in physical

dimensions was achieved in the bottom connected and socket-types of meters as well as in many component parts. Development of the convertible 2-wire, 3-wire meter, the cumulative-type demand registers, thermal-demand meter, and the betterment of indicating- and graphic-demand types were accomplished during this period, as well as many improvements in instrument transformers. Further standardization of metering equipment and improved versatility of meters were mentioned as some of the improvements that can be expected in the near future.

Considerable time was devoted to round-table discussion of such subjects as economical methods of furnishing service to one-story houses, 2½- vs. 3-element meters for three-phase, four-wire metering, metering of 265/460-v. circuits, use of "S" type polyphase meters, metering of water-heater loads, metering low-power-factor customers, and metering on the "high" side of a wye-delta transformer bank.

Subjects of mutual interest were presented at the afternoon session on Tuesday, May 4, which was held jointly with the Transmission and Distribution Committee.

Billing Provisions

For the Meter and Service Committee, A. J. Pansini presented an illustrated talk on Long Island Lighting Co.'s new central operating headquarters which contains many interesting features. H. I. Miller of the Rate Research Committee presented a paper on "Billing Provisions in Demand Type Rates." He gave a brief history of the development of rate structures and outlined the problems involved in the application of demand rates. Among the latter are such factors as the minimum number of kilowatts to be billed, which classes of customers should be included, time intervals, off-peak rates, minimum charges and power factor clauses. He pointed out that most of the problems in designing demand rates stem from the fact that such a large percentage of utility costs are related to demand or capacity. This talk provoked a lively discussion participated in by both committees.

The Transmission and Distribution Committee presentation consisted of a panel discussion on "The Trend Toward Higher Secondary Voltages." This is a subject of great importance to the meter group as the types of distribution systems planned for the immediate future must be considered in the purchasing of new meters. Close co-operation between the Meter and Service and Transmission and Distribution Committees on such subjects will be continued.

The next meeting of the Meter and Service Committee will be held jointly with the AEIC Committee on Metering and Service Methods on September 27-29, 1954, at the Leland Hotel, Springfield, Ill.

Transmission and Distribution Committee Meeting

J. W. Anderson, *Chairman*

THE Spring meeting of the Transmission and Distribution Committee was held on May 4-5 at the Edgewater Beach Hotel, Chicago, with 200 members and guests in attendance.

Overhead Group

The Overhead Group, sponsored by M. H. Pratt, opened the meeting with a symposium on higher primary distribution voltages. W. R. Bullard discussed some of the practical considerations involved, noting that higher voltages can provide equal reliability, that the hot-line tool work required may not only be safer but even less costly in urban areas because of fewer circuits and less congested poles, and that safety to the public may be improved because faults are more promptly de-energized. He suggested that a practical formula for introducing higher voltages is a rate equal to load growth plus wearing out of lower-voltage equipment.

A. J. Pansini described practical aspects considered by the Long Island Lighting Co. in introducing 13.2-kv wye distribution, which now supplies 40 per cent of the system load. Availability of substation sites and rights of way, zoning ordinances, appearance, physical features of the area, the pattern and condition of existing facilities, the pattern of load growth, and flexibility to meet unforeseen growth all are considered along with classical economic studies of each area.

C. E. Baugh discussed economic aspects of 12-kv delta systems in suburban areas. Conclusions were that there is little difference in the costs of 4-kv and 12-kv lines themselves but that 12 kv provides significant savings because of fewer substation sites, fewer miles of subtransmission, larger transformers at lower cost per kva, fewer high-voltage circuit breakers, and reduced cost of switching for equivalent service reliability.

W. R. Doar discussed the design and operation of 23-kv wye distribution now being used to an increasing extent by Carolina Power & Light Co. in both urban and rural areas. Experience indicates that this level further extends the advantages of 12 kv over 4 kv at small additional cost and without introducing any new operating problems. F. E. Sanford cautioned against overenthusiasm in converting established 4-kv systems and stressed the need for careful review of each local situation.

F. W. Myers reported that the preliminary study of problems associated with aluminum conductor fittings being conducted by Armour Research Foundation is scheduled for completion in July.

E. H. Scanlon, Chairman of the Committee on Shade Tree Selection, National Shade Tree Conference, discussed the problem of conflict between street trees and utility lines. He pointed out that there now are species of trees available to fit any situation regardless of the space involved and that long-range improvement is primarily a matter of public education. He showed slides of the wide variety of attractive species running the gamut from low, squat types to tall but extremely slender types, and also showed examples of streets where planned planting has

provided attractive foliage without conflict with utility lines.

Joint Session

The afternoon of the first day was devoted to a joint session with the AEIC and EEI Meter and Service Committees covering a variety of items of mutual interest.

A. J. Pansini described Long Island Lighting Co.'s new central operating headquarters covering over 60 acres, which was designed to provide greater co-ordination between the many elements of the operating forces.

H. I. Miller discussed the development of prevailing rate structures with particular reference to the desirability of demand-type rates as the best means of reflecting the fact that a large percentage of utility costs are related to capacity to serve.

T. C. Duncan led a panel discussion on the trend toward higher secondary voltages. H. G. Barnett, Westinghouse Electric Corp., discussed voltage spreads of 120/208Y-v, 250/433Y-v and 277/480Y-v systems as related to ranges of tolerable voltage for utilization equipment, concluding that 277/480Y-v systems are the best for commercial areas.

A paper by D. K. Blake, General Electric Co., outlined reasons why residential load cannot be expected to continue to increase at the present rate indefinitely. Even if it does, he showed how residential load still could be supplied at 120/240 v in 1983 and questioned whether or not savings from the use of a 240/480-v system can justify the cost of a nationwide transition. F. A. Cox reported that Commonwealth Edison Co. is supplying both 480-v delta and 277/480Y-v service to a number of large commercial and industrial installations but considers 120/240-v distribution adequate for supplying residential loads several times present values.

E. V. Sayles favored 277/480Y-v as the most desirable higher-voltage level but urged more general use of 240 v from existing 120/240-v residential services. H. E. Yeide reported that 277/480Y-v have not been used for general building service in Washington, although duplicate supplies at this and other higher voltages have been used to supply special classes of load such as air conditioning.

W. R. Bullard defended the need for 240/480Y-v supplies in residences and apartments as a means of relieving increasingly acute bottlenecks caused by existing wiring. He noted that many small appliances of American manufacture already are made in 240-v ratings for export and saw no reason why they cannot gradually be introduced to the domestic market. W. J. Witte supported Mr. Bullard's views, pointing out that delay only intensifies transition problems.

A. J. Pansini favored raising residential-service voltage levels rather than resorting to more costly three-phase service as a means of supplying large residential loads. A paper by F. Thornton reviewed European practices and experience with 220-v general-purpose branch circuits and outlined some of the problems to be faced by a transition to this voltage level in the U. S.

T. C. Duncan reported that the newly formed Subcommittee on Higher Secondary Voltages already has held two meetings but will require more time to study the many ramifications of the situation before it is ready to make any recommendations.

General Engineering Group

In addition to the discussion of higher secondary voltages presented at the Joint Session, the General Engineering Group, sponsored by W. M. Penney, covered a number of other items.

E. V. Sayles reviewed trends indicated by a survey of industry preferences regarding taps for distribution transformers and also distributed copies of application charts prepared by the EEI-NEMA Joint Committee on Standards for Distribution Transformers to aid in selecting proper voltage ratings and tap settings without detailed calculations.

W. C. Phillips summarized developments concerning mobile-radio and carrier systems, with particular emphasis on newly proposed FCC rules governing restricted and incidental radiation devices which would have far-reaching effects on the use of carriers and on incidental radiation from power lines.

F. W. Brooks discussed inequities resulting from determining depreciation expense on the basis of original cost when there are major changes in the purchasing power of the dollar. This practice not only prevents proper determination of real income for rate-making and tax purposes but also distorts engineering economic studies. Although the present Internal Revenue Code and other regulatory laws prevent use of any other basis for determining rates and taxes, he stressed that there is no reason why the full costs of depreciation cannot be used in making engineering economic studies.

Underground Group

The Underground Group, sponsored by H. E. Cody, opened with a paper by C. E. Betzer discussing the thickness of insulation in solid-type, paper-insulated cable. Thirty years of experience with reduced insulation thickness on the underground system in Chicago has provided a sound basis for reductions to the standard thicknesses now recommended in the current edition of AEIC specifications for solid-type cables.

J. L. Smith and E. A. Munson described some of the labor-saving tools, equipment, and methods used by Commonwealth Edison Co. to install underground cables. Considerable attention has been given to redesigning work trucks for improved safety, comfort, and efficiency. Another interesting feature was description of a method of installing steel pipe duct at street crossings by pushing or horizontal boring under the pavement.

Plans for a survey of practices in the selection, inspection, and maintenance of sectionalizing and protective devices used on radial underground systems were outlined by W. J. Witte.

Standards and Specifications Group

W. L. Vest, sponsor of the Standards and Specifications Group, called upon subcommittee chairmen to outline progress of the group.

M. H. Powell announced a favorable ballot on a revision of TD-5, "Specifications for Eyenuts and Eyelets," which soon will be released for printing. A proposed revision of specifications for steel crossarm braces has just been submitted for ballot, and proposed revisions of specifications for eye bolts and steel insulator pins are about ready for ballot. Work on new specifications for

expansion shields for galvanized lag screws and machine bolts, insulated clevises, and wire-holders is continuing, and possible revision of specifications for guy thimbles and brackets for cutouts and arresters is under study.

F. E. Moesta reported that proposed EEI-NEMA street-lighting-equipment standards for insulator head and reflector interchangeability and a revision of existing standards for metal head and reflector interchangeability are about ready for ballot. Work on a proposed standard for high-voltage controllers is continuing and a study of photosensitive control devices leading to development of a standard is being initiated.

F. A. Ashbaugh stated that proposed specifications for Douglas-fir heavy-duty crossarms, Douglas-fir braces, and locust pins all are about ready for ballot.

E. T. Coupal reported that the Fuse, Cutout, and Recloser Subcommittee is now studying the results of a survey of industry requirements for standardization of reclosers. Conclusions from an earlier survey of requirements for heavy-duty cutout ratings have been transmitted for consideration by the EEI-NEMA Joint Committee on Distribution Cutout and Power Fuse Standards.

T. C. Duncan reported that a draft of proposed specifications for solder-sweated, split, tinned-copper connectors has been submitted to members for comment. Further consideration of the development of specifications for compression-type cable connectors indicates that only a performance-type specification can be produced.

Purchasing and Stores Committee Meeting

Carl H. zur Nieden, *Chairman*

DELEGATES from 55 companies in 28 states, and from Bermuda and Canada, assembled at the Hotel Roosevelt in New York, May 2-5, for the seventh annual spring meeting of the EEI Purchasing and Stores Committee. In a program equally divided between purchasing and stores problems, discussion centered on profits and savings potentials in purchasing and stores operation and planning.

The Executive Committee met on Sunday, May 2, and the full committee convened on Monday morning. At the Monday morning session, Chairman Carl H. zur Nieden, Philadelphia Electric Co., presented Col. H. S. Bennion, Vice President and Managing Director of the Institute, who welcomed delegates. Col. Bennion cited the group as leaders of accuracy, efficiency, and economy in the industry.

Chairman zur Nieden then introduced the session chairmen, J. D. Hogg, The Cleveland Electric Illuminating Co., Vice Chairman, Purchasing, and William H. Hollis, Consolidated Gas Electric Light and Power Co. of Baltimore, Vice Chairman, Stores.

As the first speakers, Mr. Hogg introduced R. H. Sperreng, Union Electric Co. of Missouri, and H. T. Simpson, Boston Edison Co., who discussed "Purchasing and Stores Operations for Profit." In his coverage of purchasing operations, Mr. Sperreng discussed the organization, practices, and procedures of the Purchasing Department. Mr. Simpson spoke on the latest improvements and practices in stores operation, such as unit packaging, self-service stocks, and modern handling equipment.

T. E. Ryan, Consumers Power Co., reported on "Whys and Whereabouts of Reels, Drums, and Containers." His presentation was based on responses by 45 companies to a questionnaire that indicated that the companies had an aggregate of $2,200,000 invested in reels, drums, and containers, with individual investments ranging from a minimum of $4900 to a maximum of $500,000, depending upon the size of the company. Mr. Ryan indicated that with an investment of that amount, it is extremely important that all containers be properly accounted for and returned as soon as possible for the greatest amount of credit from the vendor.

To open the afternoon session at which Mr. Hollis presided, Mr. Hogg and L. C. Alexander, The Cleveland Electric Illuminating Co., presented a joint report on the project, "Problems and Values Underlying Modern Materials Handling." Discussion from the floor followed.

(*Continued on page* 236)

Seated left to right at the Purchasing and Stores Committee Luncheon on Tuesday, May 4, are A. E. Softy, EEI Accounting Director; W. M. Holls, Consolidated Gas Electric Light and Power Co. of Baltimore; E. N. Scott, Long Island Lighting Co.; C. H. zur Nieden, Philadelphia Electric Co., Chairman, EEI Purchasing and Stores Committee; J. W. Carpenter, Long Island Lighting Co.; W. H. Seaman, Long Island Lighting Co.; J. D. Hogg, The Cleveland Electric Illuminating Co.; and T. S. Dunstan, Consolidated Edison Co. of New York, Inc.

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Quantity prices and prices of individual sections upon request.		
General		
53-5—Study to Determine the Load and Revenue Potential of Apparel Stores, 1953	.50	.50
52-11—Application of Electrical Equipment in Commercial Establishments, 1952	1.00	2.50
Quantity prices upon request.		
51-15—Study to Determine Load and Revenue Potential of American Food Markets, 1951	.25	.25
51-12—Study to Determine Load and Revenue of Water Heater Market, 1951	.25	.25
R-19—Catalogue of Sales Aids for Electric Industry, 1949	1.00	2.00
P-6—The Heat Pump (7/47)	.25	.25
Lighting		
54-9—Bonus Bulb Promotion, 1954	.25	.25
52-8—Home Lighting Story of Company X, 1952	.30	.30
Power		
I-1—Power Sales Manual—Volumes I and II, includes two binders and tabs. Prices available upon request.		

NATIONAL PROGRAMS

Better Light Better Sight Bureau

"Teaching About Light and Sight"—Classroom program for teaching about light and sight in 5th and 6th grades. Price list on request.

"Living With Light" — Classroom program for teaching about light and sight in Junior High School Science classes. Price list on request.

"Lighting for Better Living"—Program for teaching about light and sight in Home Economics classes, 4-H Clubs and Extension Groups. Price list on request.

"Light Is What You Make It"—A sound movie in Technicolor produced by Walt Disney Productions, 16 mm, 10 min. Price schedule on request.

"See for Yourself" — Home lighting, sound-slide film, 15 mins. 105 frames 30.00

"Educating in a Truer Light"—School Lighting, sound-slide color film, 22 min. over 100 frames 50.00

Accompanying booklet ..... 5.00 per 100

Planned Lighting Program

Series of mailers and booklets promoting planned lighting for stores, schools, offices, industries and homes. Price list upon request.

Sales Training Program

Three Courses Available—Residential, Commercial and Rural Prices upon request.

Appliance Sales Training Course—6 Films and Records 250.00

Set of 6 Salesmen's Manuals for above course 4.50

Industrial Sales Training Handbook .. 18.50

Residential Lighting Film & Record. 30.00

Residential Lighting Salesmen's Manual .75

Mother-Daughter Program

An electrical living promotional program featuring a 27 minute color sound movie. Prices and details upon request.

OTHER PROMOTIONAL MATERIALS

*Minimum Order

Commercial Cooking

"Your Answer to Commercial Cooking" ..... .70

Quantity Prices Upon Request.

"Penny Folder"—"Invest One Cent in Electricity" ..... 4.50 per 100

Data Sheets 2.00 first set, .75 each for next 14 sets. .25 each additional set if sent to one address

	Members	Non-Members
Electric Water Systems Council		
"Case of the Missing Heart"	16.00 per 1000*	
Electrical Living		
EM-2 "Dreams Come True When You Live Electrically"	5.00 per 100*	
Home Service		
EM-5 "Electric Roaster"	9.00 per 100*	
"Carefree Cooking Electrically"	14.00 per 100*	
R-14 "Patterns for Parties"	10.00 per 100*	
EM-3 "Open the Door to Modern Home-making Education"	7.00 per 100	
Water Heating		
EM-4 "Go Electric When You Need Hot Water"	4.00 per 100*	
Wiring Booklets		
Quantity Prices Upon Request.		
M-8 "Handbook of Farmstead Wiring Design"	.40	.40
M-7 "Handbook of Residential Wiring Design"	.25	.25

Miscellaneous Publications

*Quantity prices upon request.

54-7—15th Electric Power Survey Report, 1954	.75	.75
54-3—Protection of Industrial Land, Method and Results, Report of Ind. Development Subcommittee, Area Development Committee, 1954	.40	1.00
54-1—Ohio Conservancy Law and Ohio Conservancy Districts, Report Natural Resources and Agricultural Development Subcommittee Area Development Committee, 1954	.40	1.00
53-13—"I Want to Know About the Electric Industry," 1953-1954		
2 to 99 copies	25¢ each*	
53-12—EEI Pocketbook of Electric Industry Statistics, 1953 ... Single copies	35¢ each*	
53-6—Area Development Suggestions, #3, 1953	.30	.75
53-4—Bibliography of Heat Pump, Through 1951	1.00	1.00
52-17—Area Development Suggestions, Number 2	.15	.40
52-12—Area Development Suggestions #1, 1952	.40	1.00
52-3—Report of the Industrial Development Subcommittee of EEI Rural & Urban Development Committee, 1952	.50	1.25
52-A—Report of Recreation & Travel Development Subcommittee of EEI Rural & Urban Development Committee, 1952	.25	.65
52-B—Report of Civic Development Subcommittee of EEI Rural & Urban Development Committee, 1952.	.25	.65
51-18—Specifications for Impregnated Paper Insulated Cable, High Pressure Pipe Type—1st Edition, AEIC, 1951 ..... Single Copy	1.00*	
51-4—Specifications for Impregnated-Paper Insulated Lead-Covered Cable Oil-Filled Type, AEIC, 1951 .. Single copy	1.00*	
50-7—Specifications for Alternating-Current Power Circuit Breakers (2nd Edition), AEIC, 1950	.60	.60
50-6—Principles for Sound Water Resources Development, 1950	21.00 per thousand	
	3.00 per hundred	
R-17—Specifications for Impregnated Paper-Insulated, Lead-Covered Cable, "Solid" Type (8th Edition) AEIC, 1949	1.00	1.00
R-12—Electrical Meterman's Handbook —6th Edition—1950 .. Single copy	3.30	4.90*
Q-11—Suggested Field Test Procedure for Determination of Coefficient of Performance Factor of an Electric Heat Pump While Operating on Heating Cycle, 1948	.25	.25
Q-5—Specifications for Impregnated Paper-Insulated, Lead-Covered Cable, "Low Pressure, Gas-Filled" Type—AEIC, 1948 ..... Single copies	1.00	
10 or more copies	.85	
Rate Book for 1953	20.00	30.00
Weekly, Monthly and Annual Statistics	2.00	2.00
(Includes Annual Statistical Bulletin; Weekly Electric Power Output; Monthly Electrical Research Statistics)		

Periodicals

Better Light Better Sight News (6 issues yearly)	1.00	1.00
Edison Electric Institute Bulletin (Monthly)	2.00	2.00
Farm Electrification (a bi-monthly publication) Up to 10 copies	Free	
Over 10 copies	.75	1.00
Quantity prices upon request.		
Home Service Exchange Yearly subscription	1.00	1.50
One free copy to members upon request.		

Personals

W. C. Mullendore, President, Southern California Edison Co., has been elected Chairman of the Board, succeeding **Harry J. Bauer,** who has been appointed Vice Chairman. **Harold Quinton,** Executive Vice President of the company and Vice President of the Institute, has been named President to succeed Mr. Mullendore.

After graduating from the University of Michigan, Mr. Mullendore returned to his native Kansas, where he was admitted to the bar in 1916. In the next seven years he served as counsel and liquidator for the U. S. Food Administration in Washington, special representative of the American Relief Administration in London and Berlin, and assistant to Secretary of Commerce Herbert Hoover. He began practicing law in Los Angeles in 1923 and two years later became special counsel for Southern California Edison Co. He became a vice president of the company in 1930, executive vice president in 1931, and president in 1945. He is a member of the EEI Advisory Committee.

In addition to becoming President of Southern California Edison, Mr. Quinton was recently elected Institute President. His biography appears on page 173.

A law school graduate of the University of Southern California, Mr. Bauer had served for some years in Southern California Edison's Legal Department when, in 1919, he resigned to enter private business. He rejoined the company, however, in 1926 as a member of the board, becoming president in 1933.

C. P. Conrad has been elected to the newly created position of Chairman of Iowa-Illinois Gas and Electric Co., and **Charles H. Whitmore** has been elected President.

Mr. Conrad will continue as chief executive officer of the company, determining fundamental policies and exercising general control. Mr. Whitmore, formerly vice president and general counsel, will direct and manage the operation of the company and all its staff services except finance and accounting.

In other changes, **H. A. Kleinman** and **R. Hovey Tinsman** have been elected Vice Presidents. Mr. Tinsman will continue to serve as Treasurer. **W. M. Huebsch** has been named Secretary and Assistant Treasurer, and **G. R. Wissing,** Assistant Secretary.

Robert H. Knowlton, The Connecticut Light & Power Co., has retired as Chairman of the Board of Directors. He will continue to serve as a Director of the company and a member of its Executive Committee.

Gilbert J. Williams, has been named Executive Vice President, and **Alfred M. Wade,** Vice President in Charge of Sales. Mr. Wade succeeds the late **Robert G. Ely.**

Calvin T. Hughes, Vice President, has been named Vice President and Consulting Engineer.

George Bisset, Vice President in Charge of Operations, Potomac Electric Power Co., has been elected Senior Vice President. **E. Perry Knapp,** Assistant Treasurer, has assumed additional responsibilities as Assistant Secretary.

A native of Washington, Mr. Bisset is a member of the Washington Board of Trade, Washington Building Congress, Civitan Club, Engineers Club of Washington, and American Institute of Electrical Engineers. He Joined PEPCO 35 years ago as a helper in the Meter Department.

Mr. Knapp has been with the company for 32 years and was originally employed as a clerk in the Accounting Department. He too is a member of the Washington Board of Trade.

Remarks of Harold Quinton

(*Continued from page* 174)

system of free enterprise. Quite the contrary. It has been widely demonstrated in Europe, and elsewhere, and more recently in these United States, that public ownership of power really means high-cost power—and it means much more.

What is the real objective of the proponents of public power? They know full well that electric service, including the taxes that are in our electric bills, accounts for only 1 per cent of the cost-of-living. They know full well that our electric bills account for less than .6 of 1 per cent of the total value of all manufactured products. Where in all the history of mankind can one find a service so vital to the very existence of a great nation at so small a cost?

These things they know. And they also know full well that no government-managed enterprise can honestly compete with the investor-owned industry but must be propped up by subsidies from taxpaying citizens. What is it then that motivates the public power proponents in their endless and costly economic planning?

It is perfectly clear that they are motivated by a totally un-American political philosophy. The socialized state is their ultimate aim. Their subtle invasions of, and direct attacks upon, American institutions have not ceased; and we must continue fulfilling our obligations to bring the facts concerning our business responsibilities before the American people.

The Cost Problem

(*Continued from page* 198)

match these job requirements with adequate information on operating costs, operating and capital budgets, and departmental and functional expenses? Will it be provided promptly?

5. Do your expansion plans take into account that the cost consciousness you are getting from a group presently working together may not be as easy to get from a larger organization and that specific provision may have to be made for supplying it?

Your industry has maintained a fine record for meeting the demands of the markets which it serves. You have demonstrated the ability to meet many types of expansion problems. I hope that these remarks may be of some value as you appraise the somewhat different cost-control problems of your next expansion period.

Purchasing and Stores Committee Meeting

(*Continued from page* 232)

The session concluded with a presentation on "Fuel Purchasing Policies" by J. J. Brennan, Northern States Power Co. Again a floor discussion augmented the presentation.

Reports from project and subcommittee chairmen were made during the Tuesday morning session. Included in these presentations were "How to Determine Policy on Foreign Purchases," by J. B. Homsher, Gilbert Associates, Inc., Project Chairman; "Why? Salvage and Reclamation," by R. A. Clark, The Detroit Edison Co., Project Chairman; and a report of the Standard Packaging and Nomenclature Subcommittee by its Chairman, H. E. Hodgson, Wisconsin Power and Light Co., whose subject was pole line hardware and uniform packaging of transmission and distribution line porcelain insulators. Floor discussions followed the reports of Mr. Hamsher and Mr. Clark.

F. R. Schaffer, Pennsylvania Power & Light Co., was the initial speaker at the Tuesday afternoon session. In his talk on "The Value of Records in the Control of Inventory," Mr. Schaffer reviewed the findings of a questionnaire which indicated that most companies use mechanized and nonmechanized systems, and a combination of both. A majority of companies with mechanized systems have supplementary nonmechanized records.

R. C. Wenz, Duquesne Light Co., and O. H. Aydelotte, Public Service Co. of Colorado, discussed from a purchasing and stores viewpoint, respectively, "Are Consignment and Vendors' Stocks Advantageous?" The final speaker, W. H. Humberg, Union Electric Co. of Missouri, presented a continuing report on data covering "Unit Man Hour Costs."

Luncheon meetings were held on Monday and Tuesday at which time representatives of local utility companies addressed the group. On Monday, Kendrick F. Bellows, Assistant Vice President, Consolidated Edison Co. of New York, Inc., spoke to the group on the ways electronic business machines may help the materials supply job. James W. Carpenter, Vice President, Long Island Lighting Co., talked at the Tuesday luncheon session on the experiences and observations of a purchasing agent.

The delegates spent Wednesday, June 5, visiting the Purchasing Department and Stores Installations of the Consolidated Edison Co. of New York, Inc., and Long Island Lighting Co.'s new Central Operating Headquarters and warehouse at Hicksville, Long Island.

Birmingham, Alabama, was selected as the location for the 1955 spring meeting of the committee.

CONVENTIONS AND MEETINGS

1954

JULY

1- 3 EEI Accident Prevention Committee, Mark Hopkins Hotel, San Francisco, Calif.

12-13 EEI Industrial Relations Committee Joint Meeting with Personnel Section of Northwest Electric Light and Power Association, Hotel Multnomah, Portland, Ore.

SEPTEMBER

13 EEI Purchasing and Stores Executive Committee, Cleveland, Ohio.

14-17 EEI-AGA Accounting Division Organization Meeting, Hotel Cleveland, Cleveland, Ohio.

16-18 36th Annual Meeting of Public Utilities Association of Virginias, The Greenbrier, White Sulphur Springs, W. Va.

20-21 EEI Accident Prevention Committee, Benjamin Franklin Hotel, Philadelphia, Pa.

27-29 EEI Industrial Relations Committee, Round-Table Conference, Palmer House, Chicago, Ill.

27-29 EEI Meter and Service Committee, Leland Hotel, Springfield, Ill.

29-Oct. 1 EEI-AGA Tax Committee, Brown Palace Hotel, Denver, Colo.

OCTOBER

4- 5 EEI Prime Movers Committee, DeWitt Clinton Hotel, Albany, N. Y.

6 Area Development Committee Organization Meeting, Hotel Statler, Cleveland, Ohio.

1954

6- 8 Indiana Electric Association Annual Convention, French Lick Springs Hotel, French Lick, Ind.

7- 8 Area Development Workshop, Hotel Statler, Cleveland, Ohio.

7- 8 EEI Transmission and Distribution Committee, Sir Francis Drake Hotel, San Francisco, Calif.

10-13 Controllers Institute of America, Annual Meeting, Edgewater Beach Hotel, Chicago, Ill.

11-12 EEI Electrical Equipment Committee, Hotel Statler, Hartford, Conn.

11-13 AGA Convention, Accounting Headquarters, Haddon Hall, Atlantic City, N. J.

18-22 ASCE Annual Convention, Hotel Statler, New York, N. Y.

21-22 EEI Advisory and Executive Committee, Netherland Plaza Hotel, Cincinnati, Ohio.

28-29 PIP Workshop Conference, Chase Park Plaza Hotel, St. Louis, Mo.

NOVEMBER

8-12 NARUC Convention, La Salle Hotel, Chicago, Ill.

18-19 EEI Industrial Relations Committee, in conjunction with the North Central Electric Association, Minneapolis, Minn.

29-30 EEI Prime Movers Committee, Astor Hotel, New York, N. Y.

DECEMBER

16 EEI Industrial Relations Committee, EEI Headquarters, New York, N. Y.

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

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(Terms Expiring 1955)

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(Terms Expiring 1956)

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WILLIAM WEBSTER ..... New England Electric System, Boston, Mass.
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(Terms Expiring 1957)

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W. J. CLAPP ..... Florida Power Corp., St. Petersburg, Fla.
J. E. CORETTE ..... The Montana Power Co., Butte, Mont.
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Customer Relations, C. J. BERNER.....Wisconsin Electric Power Co., Milwaukee, Wis.
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Taxation Accounting, S. J. SCHIML.....The Dayton Power and Light Co., Dayton, Ohio

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Industrial Power and Heating Section, MAXWELL COLE.....Philadelphia Electric Co., Philadelphia, Pa.
Residential Section, R. J. MILLER.....The Cleveland Electric Illuminating Co., Cleveland, Ohio
Special Service Section, J. M. STEDMAN.....Pennsylvania Power & Light Co., Allentown, Pa.

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Hydraulic Power, P. M. HESS.....Pennsylvania Water & Power Co., Lancaster, Pa.
Meter and Service, C. V. MOREY.....Consolidated Edison Co. of New York, Inc., New York, N. Y.
Prime Movers, W. L. CHADWICK.....Southern California Edison Co., Los Angeles, Calif.
Transmission and Distribution, J. W. ANDERSON.....Philadelphia Electric Co., Philadelphia, Pa.

GENERAL

Accident Prevention, R. P. DOUGLAS.....The Detroit Edison Co., Detroit, Mich.
Area Development, W. I. DOLBEARE.....Virginia Electric and Power Co., Richmond, Va.
Atomic Power, EDGAR H. DIXON.....Middle South Utilities, Inc., New York N. Y.
Codes and Standards .....To be Appointed
Electric Power Survey, WALKER L. CISLER.....The Detroit Edison Co., Detroit, Mich.
Financing and Investor Relations, R. N. BENJAMIN.....Stone & Webster Service Corp., New York, N. Y.
Industrial Relations, F. R. RAUCH.....The Cincinnati Gas & Electric Co., Cincinnati, Ohio
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Legal, T. JUSTIN MOORE.....Virginia Electric and Power Co., Richmond, Va.
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